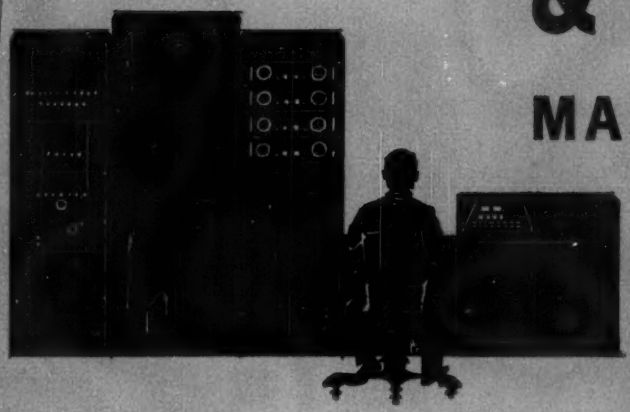
AUGUST 1961

Material Handling Engineering

Established in 1945 as FLOW Magazine

STEVENS RICE
UNIVERSITY MICROFILMS
313 NORTH FIRST ST
ANN ARBOR MICH
FIZ



Computers & Controls MAKE SYSTEMS

DARE YOU USE THEM?

DARE YOU IGNORE THEM?

FIRST REPORT **TOTAL LINE MANAGEMENT BY COMPUTER**

A BHA for Better Status

Grab that Maintenance Authority

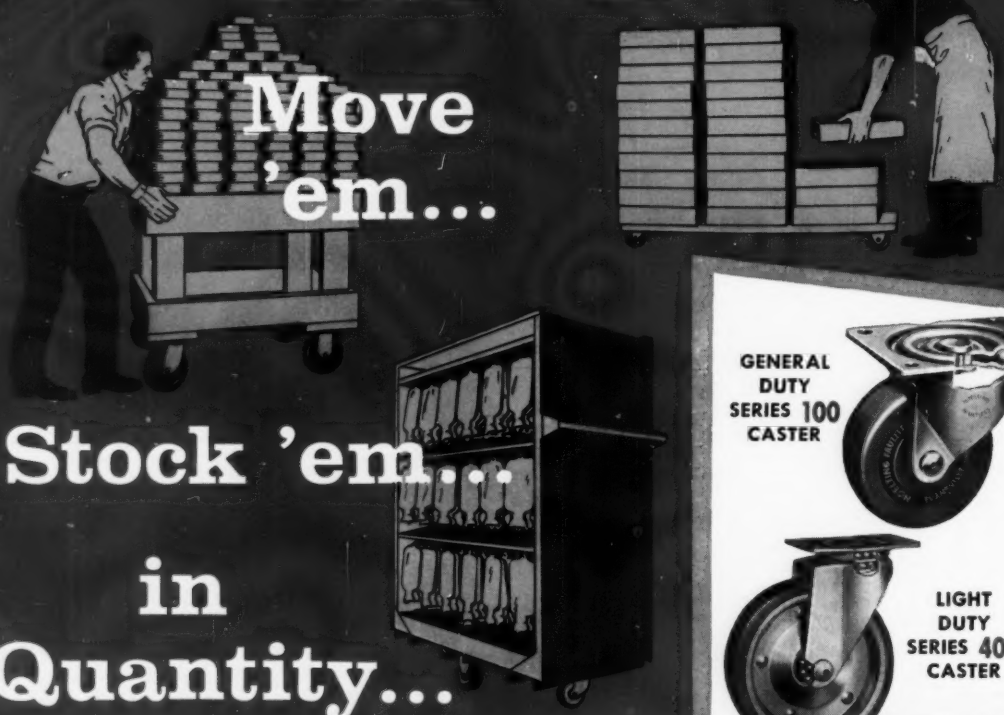
PROJECT UPGRADE:
Material Control and the Balance Sheet

mhe

THE MAGAZINE OF MATERIAL FLOW MANAGEMENT

Modular Controls Govern Flour Flow 48
How They're Maintaining 59
Even Ride Carries Bowling Pins to Plastic Dips 66

Stack 'em... Move 'em... Stock 'em... in Quantity...



on Faultless Casters

Eliminate costly, one-at-a-time handling methods with Faultless Casters! Parts—even heavy ones—can be stacked high on Faultless Casters, ready for further processing. Fully loaded Faultless Castered trucks, carts, dollies, racks roll easily, smoothly... carrying your products from machine to machine, around corners, down narrow aisles, even outdoors. And products stocked on Faultless Castered equipment require minimum rehandling for packaging, or shipping. Faultless engineers a complete line of precision casters to meet your specific requirements.

ASK YOUR DISTRIBUTOR. Your nearby Faultless Industrial Distributor and the local Faultless Sales Engineer will work with you to eliminate costly one-at-a-time handling methods at your plant. Your Distributor maintains a substantial inventory of Faultless Casters for immediate delivery.

GENERAL DUTY SERIES 100 CASTER
LIGHT DUTY SERIES 400 CASTER
MEDIUM DUTY SERIES L900 CASTER
HEAVY DUTY SERIES H900 CASTER
EXTRA-HEAVY DUTY SERIES 1300 CASTER

Casters illustrated are typical of complete range of load capacities and types available for every materials handling job.

NOELTING Faultless Casters

Faultless Caster Corporation

Evansville 7, Indiana

Branch Offices in principal cities; see the Yellow Pages of the telephone book under "Casters." Canada: Stratford, Ontario

Circle 45 on Reader Service Card

New CROSS-RIB has up to 60% thicker tread for longest life in your plant's roughest going

Here's the great new Cross-Rib Pneumatic Industrial Tire—its tread *as much as 60% deeper* than ordinary pneumatic industrials. Result: tread bars that really dig in for faster, nonspin starts—safer, nonskid stops—sure-footed travel in between.

The new Cross-Rib is made from super-toughened rubber compounds that fight gouging, abrasion and wear. And its body is muscled with Goodyear's exclusive 3-T Process Cord—for maximum strength and resistance to shock and fatigue.

For full facts on this latest addition to the No. 1 family of industrial tires—pneumatics and solids—see your Goodyear dealer.

Or write: Goodyear, Industrial Tire Sales, Akron 16, Ohio. Lots of good things come from Goodyear.

INDUSTRIAL TIRES BY

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Circle 54 on Reader Service Card

PALLETAINERS® AT WORK....

CUTTING production COSTS!

Assembly Line Handling In Georgia Plant

McDONOUGH Power Equipment, Inc., manufactures Snappin' Turtle power lawn mowers and the authentic one-half scale reproduction of the 1910 model T, as well as equipment for the textile industry.

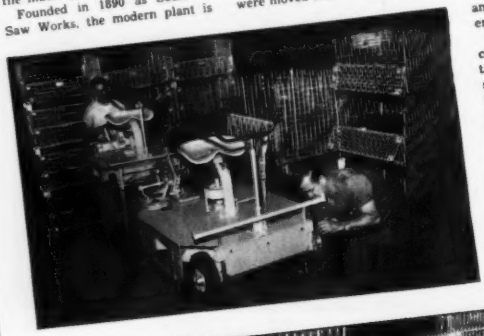
Founded in 1890 as Southern Saw Works, the modern plant is now located 28 miles south of Atlanta and employs approximately 125 people.

Because of rapid growth, materials handling problems soon became apparent. Supplying parts to the operators on the assembly line became a serious bottleneck. Parts were moved from various machine positions and to the assembly area in oil drums which had the tops cut off. This caused many accidents, and delays in manufacture due to complete loss of visibility of contents.

After careful study McDonough decided on a handling program employing Palletainers, manufactured by Union Steel Company and supplied through Wrenn Brothers, the Atlanta distributor.

Now, both raw material and machined parts are stored in Palletainers. These are moved to interim storage areas near the final assembly line, and then directly to the line itself. Gates in the containers allow the assemblers to pick out the specific part, but they know exactly how many they have, eliminating shutdowns. With multiple lines and models, visibility and consistent tare (for weight count) become vital features.

Palletainers are used entirely within the plant, handling all parts by fork truck.



● Palletainers handle *anything* better! They increase your production efficiencies, improve your plant's appearance and quickly pay for themselves in manhours and space saved. Palletainers are practically indestructible . . . built to endure rough, fast handling for years to come. They are available in a wide range of sizes, types, styles and loading capacities from 250, 500, 1250, 2000, 4000 to 6000 pounds per unit.

Why not see for yourself how USP Palletainers . . . or the new small size 'Juniors'—could save time, money and effort in *your* plant.

You may try regular Palletainers — or the small size 'Juniors' in your plant on a 60-day memo billing basis. Your obligation is freight only!

Gentlemen:
Please send me complete information and literature on USP Palletainers.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Please have your Palletainer representative contact me ☐

UNION STEEL PRODUCTS CO.
400 N. BERRIEN STREET
ALBION, MICHIGAN

Circle 121 on Reader Service Card

reader's guide to

AUGUST 1961

Material Handling Engineering

volume 16 number 8

Established in 1945 as FLOW Magazine

COMPUTERS AND CONTROLS MAKE SYSTEMS 45
And the material handling man is caught up in the problems of planning and specifying.

COMPUTER CONTROLS BLAST FURNACE 46
Modular Controls Govern Flour Flow 48
Two good examples of the new handling technology.

TOTAL LINE MANAGEMENT BY COMPUTER 50
Western Electric makes the latest breakthrough in continuous automatic production.

A BHA FOR BETTER STATUS 52
MH elder statesman Harry Freeman tells how to upgrade handling education.

MATERIAL CONTROL AND THE BALANCE SHEET 54
Sixth Project Upgrade article discusses accounting from the MH man's viewpoint.

TIPPING THE BALANCE SHEET YOUR WAY 56
Ways to keep inventory a respectable item on the balance sheet.

HOW THEY'RE MAINTAINING 59
Case histories of good material handling maintenance.

GRAB THAT MAINTENANCE AUTHORITY! 62
Three top MH superintendents tell you why and how:

Maintain Your Own Handling Equipment 62
Keep Maintenance Centralized 63
MH Maintenance Is a Specialty 63

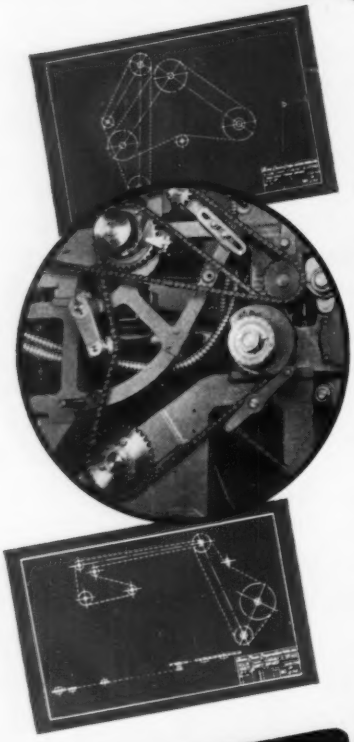
EVEN RIDE CARRIES BOWLING PINS TO PLASTIC DIPS 66
Precise conveyor regulation is the key to perfect coating.

DEPARTMENTS

6 . . . News Roundup
16 . . . Calendar
21 . . . Cost Cutting Ideas
34 . . . Product News
68 . . . Packaging & Shipping Ideas
70 . . . Bulletins, Catalogs & Films
92 . . . Associations
94 . . . Industry News
99 . . . Classified
100 . . . Advertisers' Index

BPA FRANCHISE CIRCULATION DISTILLED WRITING

copyright 1961 by The Industrial Publishing Corporation



In engineering service and delivery from the manufacturer

Each dollar invested in Acme Chain buys the highest quality product that experience, material, design, craftsmanship and facilities can produce at competitive prices. But your dollar value doesn't end here. Acme has built its enviable reputation for giving its customers fast excellent engineering and technical service from start to finish.

Whatever the problem, Acme's Engineering Department has always been on hand to supply its customers with a fast practical solution.

Be sure you get this extra value from every dollar you invest in roller chains. Consult your nearest Acme Distributor or write our Engineering Department for the answer to your power transmission or conveying problems.

Write Dept. 29-Q for new ill. 100 page catalog with engineering section.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

RELIABLE CHAIN DRIVES FOR ALL INDUSTRIES

ROLLER CHAINS, SPROCKETS, CONVEYOR CHAINS, FLEXIBLE COUPLINGS, ATTACHMENTS. (Special and Standard)

Circle 1 on Reader Service Card

Material Handling Engineering

EDWIN M. JOSEPH ..... *publishing director*
CHARLES M. FALLON ..... *general manager*
BERNARD I. KNILL ..... *editor*
JACK E. ATZINGER ..... *associate editor*
RICHARD H. DIETZ ..... *associate editor*
JOHN F. SPENCER ..... *associate editor*
JAMES M. PUMMER ..... *associate editor & production manager*
BERT BENKENDORF ..... *art editor*
HENRY LEFER ..... *eastern editor*
SCHOLER BANGS ..... *western editor*
E. RALPH SIMS, JR. ..... *consulting engineering editor*
DAVID KINSLER ..... *distilled writing*
M. SELZMAN ..... *editorial asisstant*
M. N. BENEDETTO ..... *editorial assistant*
ALARIC MAUSSER ..... *art director*
N. G. KISER ..... *circulation director*
MICHAEL NASSIF ..... *franchise production*
LEW DAVIS ..... *franchise representative*
ROBERT GAUVIN ..... *manager, reader service department*

SALES OFFICES:

Cleveland 15, Ohio
812 Huron Road
SUperior 1-9620
RICHARD C. GROVE, *representative*

New York 17, New York
60 East 42nd Street, Room 836
MUrray Hill 7-3420
LEE HAAS, *manager*
JAMES ROBINS *representative*
ARTHUR JOYCE, *representative*

Chicago 11, Illinois
520 North Michigan Avenue, Suite 704
WHitehall 3-1655
CHARLES F. GEYER, *manager*
E. H. ST. JULES, *representative*
TOM MULLIN, *representative*
S. R. TRACY, *representative*

Los Angeles 57, California
672 South Lafayette Park Place
DUnkirk 7-5104
ALAN T. CAZIER, *manager*
LLOYD BROOKMEYER, *representative*

London, S. W. 1, England
36 Victoria Street, London, S.W.1, England
SUllivan 6072
JOHN A. LANKESTER, *manager*

SUBSCRIPTIONS in the United States and its possesions, $7 a year, $12 for 2 years; in Canada, $8.50 a year; in the United Kingdom, £3.5.0 a year, payable in sterling at our London office; other foreign, $10 a year. Single copies (when available): 1 to 10, 75¢ each; 11 to 25, 60¢ each; more than 25, 45¢ each. Canada: 75¢ each. Foreign: $1 each.

PUBLISHED monthly and copyrighted 1961 by The Industrial Publishing Corp. Accepted as a controlled circulation publication at St. Joseph, Mich. Printed in U.S.A. Return form 3579 to 812 Huron Road, Cleveland 15, Ohio.

THE INDUSTRIAL PUBLISHING CORP.
812 Huron Road, Cleveland 15, Ohio
SUperior 1-9620

LESTER P. AURBACH ..... *president*
EDWIN M. JOSEPH ..... *executive vice president*
LEE HAAS ..... *vice president*
CHARLES F. GEYER ..... *vice president*
N. N. GOODMAN, JR. ..... *vice president*
PAUL ROLNICK ..... *vice president*
T. L. DEMPSEY ..... *asst. secretary treasurer*

AFFILIATED PUBLICATIONS: Hydraulics & Pneumatics, Welding Design & Fabrication, Modern Office Procedures, Occupational Hazards, The Refrigeration & Airconditioning Business, Precision Metal Molding, Handling & Shipping, and Power Transmission Design.

INDEXED by Engineering Index, Inc.

MICROFILMED copies of Material Handling Engineering are available from University Microfilms, 313 North First Street, Ann Arbor, Michigan.

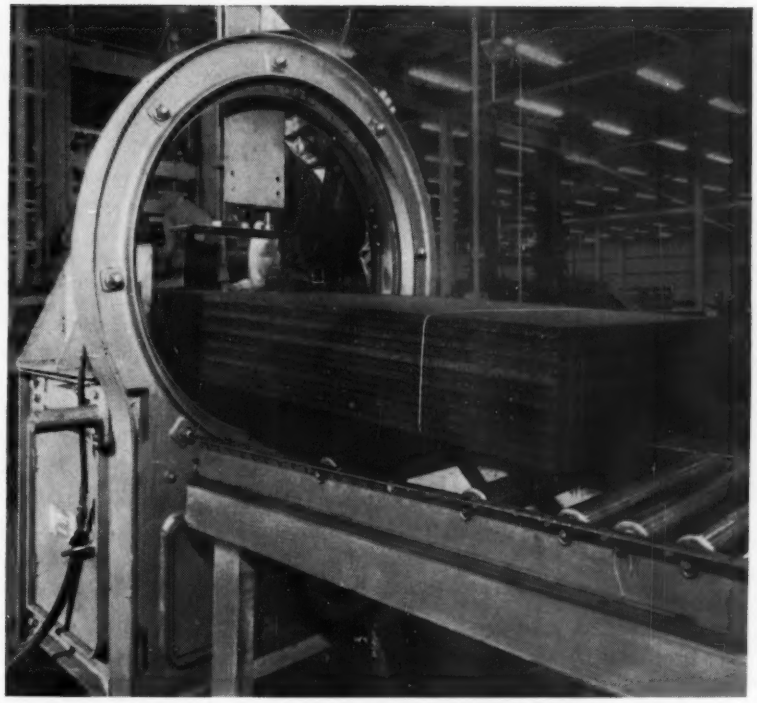
IT'S BOUND TO BE BETTER WITH USS STEEL STRAPPING

Model 12 straps 240 of these 2′ x 4′ packages in an hour!

At Celotex, the automatic Model 12 wraps each 6-unit fiberboard bundle twice with strong 18-gauge USS Round Steel Strapping. It handles various size bundles without adjustment. The Model 12 takes only 7½ sq. ft. of floor space and it weighs only 1300 pounds.

The Model 12 also speeds production at Celotex. "Before we switched to automatic strapping, we handled our fiberboard bundles at least 4 times between production line and shipping dock," says Mr. F. J. Alfeis, Work Manager at the L'Anse, Michigan plant. "Since we installed the automatic USS Round Steel Strapping machine, our bundles are compactly wrapped, palletized, and moved by fork-lift truck directly to outside carriers in one simple operation."

Find out how the Model 12 can help your product cost less to handle, store, ship, and receive. See our new industrial film showing many possible applications for the Model 12. Send the coupon.



U. S. Steel Supply
Division of
United States Steel

USS
TRADEMARK

U. S. Steel Supply
U. S. Steel Corporation
208 South LaSalle Street
Chicago 4, Illinois

☐ Please send me more information on the automatic Model 12 Strapping Machine.
☐ Please send me your Model 12 film, "Tie This."

Name_____

Company_____

Address_____

City_____ Zone____ State_____

Circle **122** on Reader Service Card

NEWS ROUNDUP

Plan 1962 show for West Coast

ASSISTANCE WITH INDIVIDUAL PROBLEMS will be a feature of the 1962 Western Material Handling and Packaging Show, May 9 through 11, in Los Angeles. A number of information, planning, workshop, and service areas—called Applied Technology Centers—will be set up by experts to aid buyers and users with advice on specific difficulties. The show is sponsored by the American Material Handling Society's Los Angeles Chapter, endorsed by the Southern California Chapter, Society of Packaging and Handling Engineers. Chairman is A. E. Flinck, Ford Motor Co.

Rails for accurate positioning

EASTMAN KODAK CO. uses a rail-guided lift truck in its film warehouse. Attachment on the 2,000-lb. Clark lift truck positions accurately, quickly at 6-tier storage racks. There's no need to steer. The attachment shifts laterally to feed 600-lb. boxes of film into openings on either side of the aisle. The attachment uses live rollers, powered by roller chains and a hydraulic motor. Operator stands on rear platform of truck.

Progress in standards, specifications

BACKED BY SEVEN ASSOCIATIONS, the MH 8 sectional committee, American Standards Association, began work on dimensions of rail and motor freight docks. The American Material Handling Society is administrative sponsor. Richard K. Hopkins, chairman of the AMHS standards committee, is sectional committee supervisor. Three subcommittees and their chairmen: railroad dock requirements, William C. Humphreys, railroad architect; motor freight dock requirements, Hopkins, General Electric Co., and material handling equipment requirements, Russell Hastings, Clark Equipment Co.

The MH 6 sectional committee approved a scope calling for pictorial markings standards applied to shipping containers of nondangerous goods. These markings will indicate special handling requirements. MH 6 chairman is Robert H. Macomber, Insurance Co. of North America. Administrative sponsors are AMHS and the Society of Packaging and Handling Engineers.

The Electric Overhead Crane Institute issued specifications for electric overhead traveling cranes in a 28-page booklet "E.O.C.I. Specification #61." It contains crane information in six sections: basic specifications, structural design, mechanical design, electrical equipment, glossary of crane terminology, and appendixes. You can get a copy through an E.O.C.I. member.

A 12-page pamphlet establishes "Specifications for Douglas Fir and Western Softwood Plywood Pallets." It was published by the National Wooden Pallet Manufacturers Association and the Douglas Fir Plywood Association. The specifications create two grades, custom and industrial. They also cover designs, construction techniques, nomenclature, fastenings, permissible nailing defects, and dimensional tolerances. You may get a copy from pallet suppliers or from NWPMA, 609 Barr Bldg., Washington 6, D. C.

Gould gets NASA contract

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION awarded a research and development contract to Gould-National Batteries Inc. for nickel-cadmium sealed cells. These currently are used to provide electrical energy for alarm systems, telemetering devices, portable consumer products, communications systems, and others. Under the contract, Gould will develop the cell's separator characteristics and hermetic seal for use in satellites.

Offers degree in operations research

NEW YORK UNIVERSITY established a new curriculum in operations research, making

Continued on page 8

Cat Wheel Loaders prove themselves on the job

WHEREVER THEY WORK—WHATEVER THEY DO...CAT WHEEL LOADERS ARE GETTING THE WORK DONE QUICKLY, ECONOMICALLY, SAFELY

Broad River Brick Co., Gaffney, S. C.—Cat 944 Wheel Loader scoops up a full bucket of brick clay for hopper charging. "Our 944 is fast, maneuverable and easy to operate," reports the assistant plant manager, who measures machine features in terms of daily performance... and is well satisfied.

Great Western Sugar Co., Scottsbluff, Nebraska, uses a Cat 966 to truck-load stockpiled beets for processing at the local plant. With a special 6-yd. bucket, the big Caterpillar 966 loads 1500 tons of beets daily from various stockpiles over the Scottsbluff Valley.

• Three Sizes: 922 – 80 flywheel HP (105 HP max.), choice of gasoline or Cat Diesel Engine; 944—105 flywheel HP (135 HP max.), choice of gasoline or Cat Diesel Engine; 966 – 140 flywheel HP (205 HP max.), Cat Diesel Power.

• Bucket Sizes from 1¼-2¾ yd. with special buckets, including side dump, and forks always available from the Cat Dealer.

• Power Shift Transmission – fast response, smooth on-the-go shifting at the touch of a finger.

• Automatic Bucket Positioners—speed cycles. One touch on lift lever raises full bucket to dumping height and *holds* it. Another touch on tilt lever automatically positions bucket at the correct digging angle. Operator is free to maneuver loader.

• Easy On-and-Off Design – operator mounts machine via three steps. He sits *behind* the lift arms and has visibility all around. This safety gives him confidence, speeds the work.

• Diesel Fuel Range—Cat Diesels use the heavier, lower-cost, high-energy No. 2 furnace oil – as well as the premium grades.

• Live-Action Hydraulics – for fast-acting bucket and lift movements with high lift capacity. Pump is driven direct from engine, keeps hydraulics fast regardless of load on drive wheels.

• All-Weather Starting – with independent gasoline starting engine available on all diesel models. Direct electric key starting is standard.

• Dual Braking – one brake neutralizes the transmission as it stops the machine, transferring extra power to the bucket, assuring full loads in tough material. Right brake pedal stops machine with transmission engaged... for full control.

Your Caterpillar Dealer will gladly show you these machines, their many features and how they can be tailored to your needs. See him soon. Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

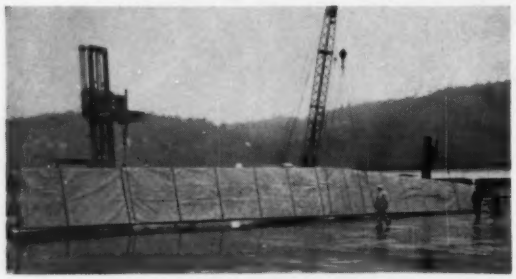
Circle 18 on Reader Service Card

NEWS ROUNDUP

available bachelor's, master's, and doctor's degrees. Operations research is the use of scientific methods to solve management problems. Department Chairman Norman N. Barish said students will take courses from each of four groups organized within the newly-named department of industrial engineering and operations research: mathematics and statistics, physical and social sciences, systems analysis and decision-making, and humanities.

Wrap huge beams in paper

THEY USED PAPER to wrap seven laminated timber beams for a trip from Portland, Oregon,



to Gary, Indiana. Each beam, 114 ft. long, 20 tons, will help support a high school gymnasium roof. Each took 2,500 sq. ft. of tough, water resistant paper made by American Sisalkraft Co., division of St. Regis Paper Co. The packages were strapped with steel bands. The paper protected the beams at on-site storage as well as during the trip on five rail flatcars. Each beam, made by bonding Douglas Fir lumber under pressure, has enough lumber to build two houses.

Seek Papers on Communications

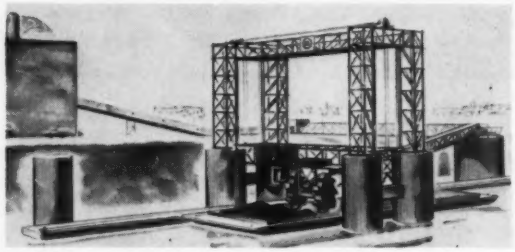
THE PROFESSIONAL GROUP ON VEHICULAR COMMUNICATIONS, Institute of Radio Engineers, would like you to submit a paper on vehicular systems and equipment designs. If accepted, your paper will be read at the group's 12th National Conference Nov. 30 to Dec. 1 in the Radisson Hotel, Minneapolis. First, send a 500-word abstract by Sept. 15 to William J. Weisz, Motorola Inc., 4501 W. Augusta Blvd., Chicago 51, Illinois. Theme of the meeting is "The Unseen Future of Vehicular Communications." You may discuss unusual techniques, new components or related circuitry, interference reduction, bandwidth utilization, land vehicular, signaling, solid state applications, air-ground communications.

Decade of integrated data processing

A COMPUTER SPECIALIST, John A. Goldsmith, calls the next 10 years the decade of integrated data processing. He said the United States will have about 11,500 computers in operation, and Great Britain, 1,100. This was reported in a British publication, Target. Also reported were the remarks of W. F. Brackman, Gillette Industries, on computer fever in the U.S. "It was becoming a sort of status symbol," said Brackman, "to have a computer on order. When company president A heard that company president B had ordered a computer, he would be apt to order an identical machine—and then call in his controller and tell him that he had better make it work. This might seem ridiculous in big business today, but it was happening there (U.S.) then and I hope that it is not happening here (G. B.) now."

Coal unloading at 3 cents a ton

McDOWELL-WELLMAN Cos., Cleveland, announces a new coal barge unloading system, featuring a rotary bucket wheel. The firm says the system, rated at 3,000 tons an hour, could handle 10,800,000 tons a year at 3 cents a ton. Bucket wheel sits on an elevating bridge, feeds lower end of a collecting conveyor. Upper end of the conveyor mounts on a traveling pivot, connects with a landward conveyor. Unload-



ing essentially is a one-man job. He positions the wheel, guides it through one cycle with first barge. This limits travel, registers it on a memory tape which can be stored and fed to the controller whenever a similar barge enters the system. Big economy with wheel unloader is reduced maintenance, says firm.

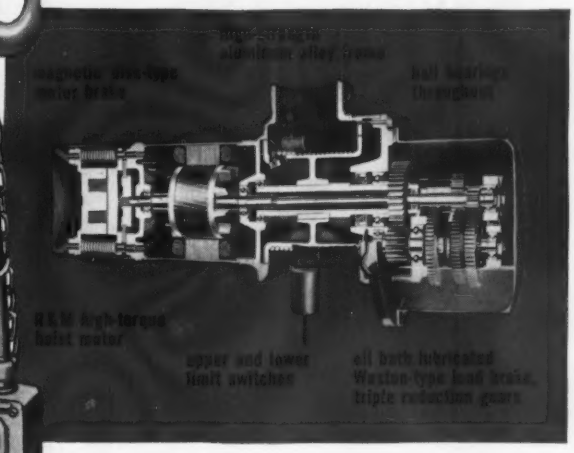
Hold plant layout course in Kansas City

THE SIXTH ANNUAL Midwest Work Course on Plant Layout & Facilities Planning will start Sept. 18 in Kansas City, Kansas. There will be five full days of study related to expansion, consolidation, and decentralization of plant fa-

Continued on page 10

RUGGED, RELIABLE, LOW PRICE HOIST

Low price . . . yes! But within the rigid, high-strength aluminum alloy frame and steel covers of R&M's Type J Hoist, you'll find carefully engineered features that assure rugged, reliable duty! The high-torque, totally-enclosed R&M motor has 30 min., 55° C. time-rise rating. Magnetic disc-type motor brake prevents hook drift . . . you get a Weston-type load brake too. Upper and lower limit switches prevent hook block over-travel. Triple-reduction gearing of heat-treated alloy steel gives hard working surfaces and shock-resistant teeth. Ball bearings, used throughout, are oil bath lubricated or lifetime sealed. Push button magnetic controls operate on reduced voltage. Type J's are stocked near you, in capacities of ¼, ½, 1 and 2 ton. Lug mounting is standard . . . choice of push, hand-geared or motorized trolley. Write today for Bulletin 905-MH



take it up with R&M®

ROBBINS & MYERS, INC., Springfield, Ohio

Electric Hoists and Overhead Traveling Cranes • Fractional and Integral HP Electric Motors • Moyno® Industrial Pumps
Propellair® Industrial Fans • R & M-Hunter Fans and Electric Heat • Trade-Wind Range Hoods and Ventilators
Subsidiary companies at: Memphis, Tenn., Pico Rivera, Calif., Brantford, Ontario.

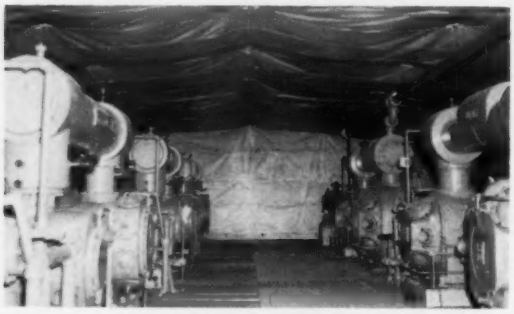
Circle **102** on Reader Service Card

NEWS ROUNDUP

cilities. Technical director is Richard Muther, executive director of Richard Muther & Associates. Get more information from E. S. Avison, assistant manager of the University of Kansas Extension Center, 39th & Rainbow Blvd., Kansas City 3, Kansas.

Protects against rust, corrosion

STORED MACHINERY need not be dismantled, grease coated, nor wrapped when you use



plastic-coated burlap hutments. Dehumidifying units are used, but more effectively because the hutment is just the size needed. You don't have to dehumidify a large shed. Hutment ceilings and walls are 10-ounce burlap, extrusion-coated on each side with a 4-mil film of Tenite polyethylene. The plastic is supplied by Eastman Chemical Products Inc., extrusion coating done by Ludlow Plastics. Use has been limited to military ordnance equipment, but it has potential for industrial and commercial warehousing.

Largest conveyor belt tester

UNITED STATES RUBBER CO. expects its new belt tester at Passaic, N. J., to help develop better belting. It's 65 ft. long, weighs 100 tons, takes belts up to 140 ft. long at 2,000 fpm. The firm calls the electronically-controlled tester the world's largest. It can accelerate rapidly, duplicate surge loads encountered in the field. It also simulates a wide range of conditions to test fabrics, covers, flex resistance, tension rating, rigidity, and splices.

Battery powers ice dumper

THE ARMY COLD REGIONS RESEARCH & ENGINEERING LABORATORY mines ice to create sub-

Continued on page 14

THE ONLY UNITIZED SLIDE BED BELT CONVEYORS IN WIDTHS from 1 to 48"!

All-Purpose conveyors that grow with your needs. All components are standardized allowing conveyors to be lengthened or shortened as the need requires. A full range of widths, plus standardized parts, permits complete flexibility within your plant.

Mail coupon for detailed information

ISLAND EQUIPMENT CORP. Dept. MHE-8
P.O. BOX 380276 • MIAMI 38, FLORIDA
Please send information on the following:
☐ STANDARD UNIT
☐ NARROW BELT UNIT
☐ OTHER CONVEYORS—PLEASE LIST
Company.....
By.....
Address..... State.....
City.....

Unitized
STANDARD UNIT
The perfect mechanized table for assembly, inspection and packaging operations. Movable or stationary—available in steel or stainless steel with fixed or variable speed. 8", 12", 16", 18", 24", 30", 36", and 48" widths.

Unitized
NARROW BELT UNIT
A versatile, low-cost unit for conveying lightweight articles for assembling, inspecting or packaging operations. Easy to install — economical to operate. 1", 2", 3", 4", 5", and 6" widths.

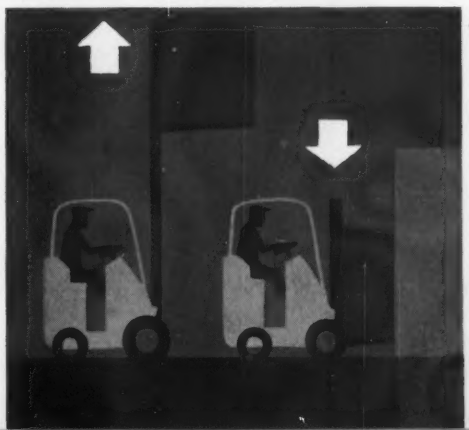
Serving Industry 20th Year
Circle 63 on Reader Service Card

Raising unit loads 12' high one minute, then driving into low-clearance vans the next, is one of the unique features of new Towmotor "Van-Stack" Series fork lift trucks (above). These 32" wide "compacts" zip through 3-foot aisles, maneuver sharp corners, hustle big jobs with unusual economy.

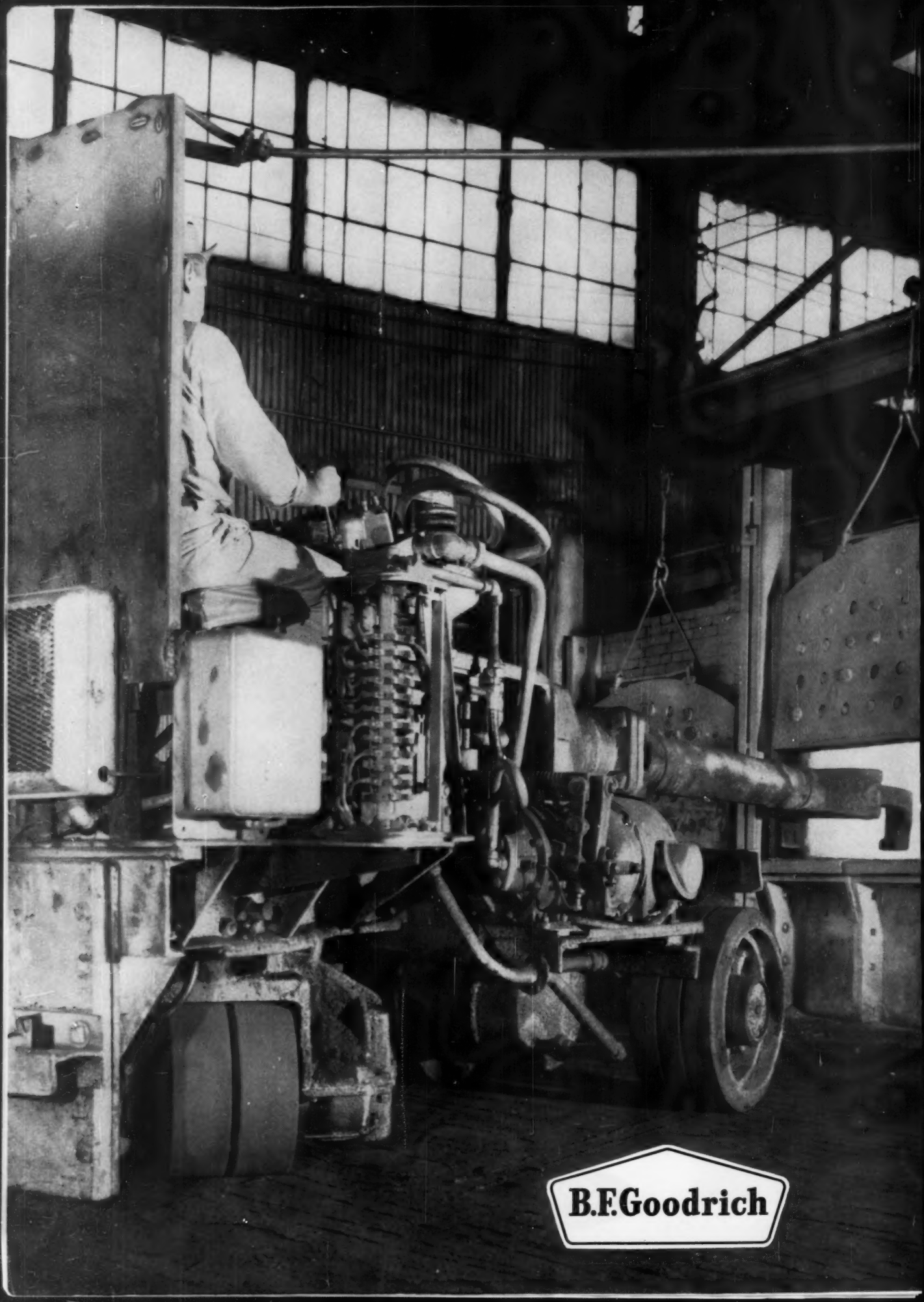
TOWMOTOR'S ON THE MOVE

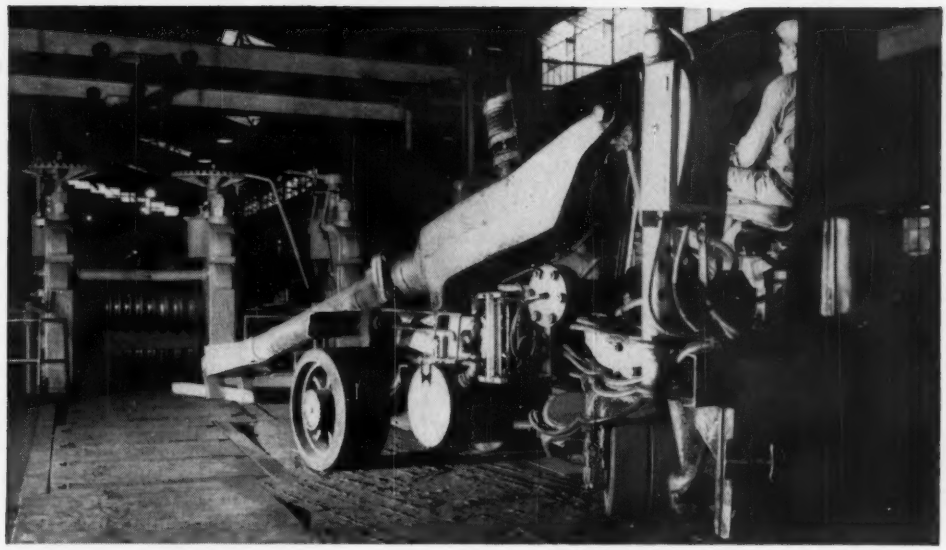
—broadening industry's concept of low cost material handling. Advancing the modern "compact" idea with small but mighty lift trucks that move around fast—pick up ton-loads—stack high in warehouse—duck low into trailers—do many jobs instead of a few. Keep on the move with Towmotor fork lift trucks—made only by TOWMOTOR CORPORATION, CLEVELAND 12, OHIO.

TOWMOTOR
THE ONE-MAN-GANG ®



Circle **116** on Reader Service Card


B.F.Goodrich



RED-HOT STEEL BARS travel from Jessop's heat treating furnace (photo at left) to rolling mill (above) on new B.F.Goodrich Novitane solid industrial tires. Ordinary tires used to go to pieces in 2 months or less, but Chief Engineer S. W. Moore writes, "The wearing quality of BFG Novitane tires is more than 3 times that of any other tire we've ever used. Downtime and maintenance costs are decreased."

New B.F.Goodrich industrial tires put a damper on hot-steel handling problems

JESSOP STEEL CO. GETS 3 TIMES MORE TIRE SERVICE BY FOLLOWING TW ANALYSIS MAN'S ADVICE

Razor-sharp steel scrap, red-hot scale and grease and oil once presented a terrific problem to Jessop Steel Co., Washington, Pa. Ordinary tires on the Auto-Floor Charging machine (used to deliver steel bars to the heat treating furnace and rolling mill) were being torn to pieces in 2 months or less. Tire costs skyrocketed. Efficiency dropped.

Then Jessop called in the B.F.Goodrich Tire & Wheel Analysis Man. He studied the whole problem, then recommended a switch to new B.F.Goodrich Novitane tires. These tires are made of a new BFG-developed polyurethane compound that shrugs off the materials which kill regular tires. The Novitane tires pictured have been on the job over 5 months. Try to find a sign of wear on them.

This case history is typical of the savings B.F.Goodrich Tire & Wheel Analysis Men offer. Without cost or obligation, the TW Analysis Man will study your setup—floors, loads, equipment, etc. Then he'll recommend the BFG tires that will give longest service at lowest cost—advice that is unbiased because B.F.Goodrich makes a complete line of industrial tires. Why not take advantage of this free BFG service? Mail the coupon today.

A special B.F.Goodrich consulting service is available to manufacturers of materials handling equipment.

A FREE B.F.Goodrich TW Analysis can save you as much as 50% on industrial tires, as much as 20% on maintenance costs. Mail the coupon today.

The B.F.Goodrich Company
Dept. TW-846, Akron 18, Ohio

Please send me additional information on your free Tire and Wheel Analysis Plan.

Name_____

Company_____

Street_____

City_____ Zone____ Street_____

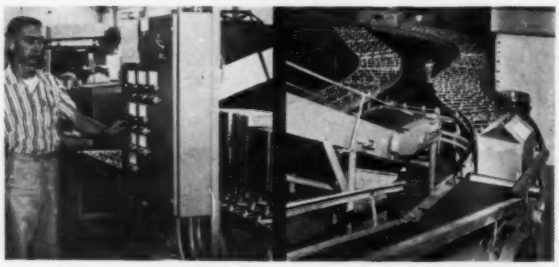
Specify **B.F.Goodrich tires when ordering new equipment**

Circle **53** on Reader Service Card

METZGAR PLAYS BIG PART IN NEW IBM SYSTEM

IBM's new Parts Distribution Center in Rochester, Minnesota, includes a two-level Metzgar conveyor system which helps achieve the following results:

- Usable warehouse space increased 16% — 10,500 sq. ft.!
- Internal trucking time reduced 70%!
- Manual handling of parts reduced 50%!
- Receiving-to-storage time reduced from 24 hrs. to 6 hrs.!
- Cost of entire system will be recovered by savings in first 27 months of operation!



FREE **— Pictures and diagram of entire system. Ask for it!**

METZGAR CONVEYOR CO.

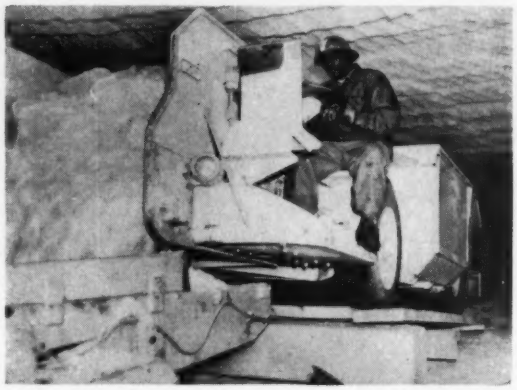
400 Douglas St. N.W., Grand Rapids 4, Mich.

WHEEL & ROLLER GRAVITY CONVEYORS • LIVE ROLLER CONVEYORS
POWER BELT CONVEYORS • SWITCHES • ACCESSORIES

Circle 84 on Reader Service Card

NEWS ROUNDUP

surface storage and housing in the Arctic. This is in Greenland only 700 miles from the North Pole, a region where yearly temperatures average 8° F. This battery-powered shuttle car dumps ice on a belt conveyor which leads to outside disposal. Shuttle car works two 10-hour shifts a day during the summer. Battery is an



80-cell Exide nickel-iron-alkaline. In winter, it's discharged, short-circuited, and stored at the site.

Builds power station for India

STEPHENS-ADAMSON'S INTERNATIONAL DIVISION completed a huge coal handling system

for a power station near Bombay. The firm engineered and erected the system, including rail unloading equipment, conveyors, storage facilities, crushers, samplers, and more. Belt conveyors, ranging from 48 to 30 inches wide, handle 275 tons of coal an hour. Conveyors feature bent-plate combination stringer, top chord and decking with under-frame construction on galleries. S-A also furnished the largest crusher ever built, equipment for pits and tunnels, belt scale, magnetic separator, and ventilating system.

Bright New Star on the Sweeper Horizon
The All-New Wayne STARSWEEP 1054!

Wayne—world's leading name in sweepers—presents the super-rugged, powerful new **STARSWEEP 1054** . . . *the most important advance in Power Sweeping ever made!* This husky, compact, maneuverable, built-to-last beauty has every feature you've ever wanted . . . exclusive *job-engineered* features that make Power Sweeping pay for itself as never before! With its 62" sweeping swath and 16 cubic foot hopper capacity the **1054** is the biggest Power Sweeper made. You sweep the biggest areas—acres outside and miles of aisles inside—with ease and speed. **STARSWEEP'S** exclusive new hydra-mechanical drive provides both *infinitely variable* travel speeds (0-12 MPH) and *constant* broom and vacuum blower speeds for super-efficient sweeping. Full-floating main and hydraulically driven side brooms adjust automatically to every sweeping condition. 54" expandable main broom can be changed in minutes *without tools*. **STARSWEEP'S** exclusive new Filter-Vac enclosed dust control system with huge 78 square foot filter area provides the ultimate in dust-free operation under all conditions . . . disposable filters are cleaned with the flick of a lever. Convenient automotive controls assure quick, safe, efficient and comfortable operation. There is so much *more* to tell . . . *more* in sweeping ability, performance, economy, dependability, local parts and service. Get the facts. See and compare. Find out for yourself how the **STARSWEEP 1054** can save you time and money. The full story is yours for the asking. Mail the coupon today.

WAYNE STARSWEEP POWER SWEEPERS

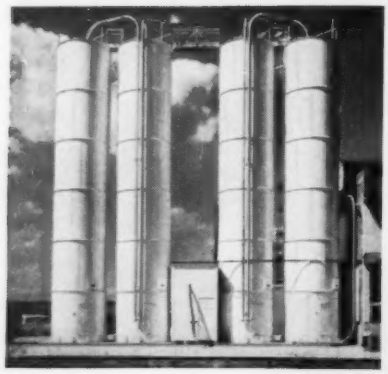
WAYNE MANUFACTURING CO.
main office and plant:
2405 E. Lexington St., Pomona, California
branch offices:
ATLANTA • CHICAGO • NEWARK

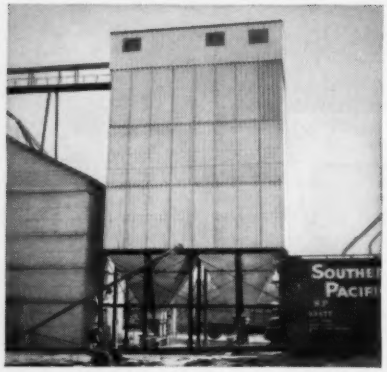
☐ I would like to see the STARSWEEP in action.
☐ Please send me the new STARSWEEP brochure.

Name_____
Title_____
Address_____
City_____ Zone____ State_____

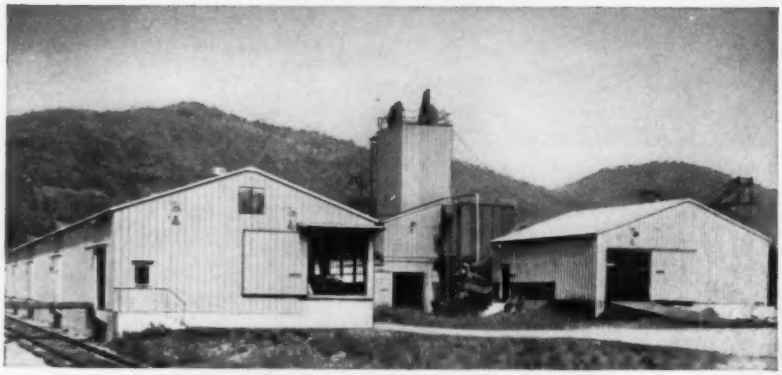
Circle **123** on Reader Service Card

The smart way to go bulk

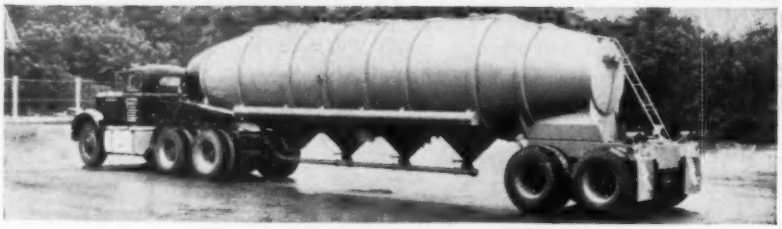




BUTLER TANKS



BUTLER BUILDINGS



BUTLER TRANSPORTS

Planning and erecting bulk facilities the traditional way can be a costly investment in time and capital. The economical way to go bulk is with Butler.

Pre-engineered Butler tanks and buildings can be ordered from stock. Routine engineering and costly custom fabrication are eliminated. Bolt-together assembly speeds erection. Rugged construction cuts maintenance and insurance costs.

The tanks can be furnished in sizes to fit any space or volume need. Butler buildings, in clear-span sizes up to 120′ wide, are available with metal cover panels in natural finish or attractive, factory-applied colors. Butler's pneumatic unloading trailers will handle maximum payloads of almost any dry flowable easily and economically. Liquid trailers are also available.

Whatever your bulk storage and handling needs, Butler has the smart solution to your problem. Write for details.

CELEBRATING 50 YEARS BUTLER FABRICATING METALS

BUTLER MANUFACTURING COMPANY

Industrial Bulk Sales Division

7370 EAST 13TH STREET, KANSAS CITY 26, MISSOURI

In Canada contact Butler Manufacturing Company (Canada) Ltd., 3455 Queen Elizabeth Way, Burlington, Ontario

Circle 16 on Reader Service Card

CALENDAR OF EVENTS

September 6-8

Second International Cargo Handling and Coordinated Transportation Exposition
Pier Nine, North River
New York City

September 18-23

6th Annual Midwest Work Course on Plant Layout and Facilities Planning
The University of Kansas Extension z Center
Kansas City, Kansas

October 16-20

National Safety Congress
Chicago

October 31, Nov. 1-2

10th Canadian National Packaging Exposition
Automotive Building, Exhibition Park
Toronto

November 4-7

Eighth Annual Building Materials Exposition
McCormick Place
Chicago

November 7-10

Packaging Machinery Manufacturers Institute Show
Cobo Hall
Detroit

May 8-18, 1962

Mechanical Handling Exhibition
Earls Court
London

May 9-11, 1962

Western Material Handling & Packaging Show
Great Western Exhibit Center
Los Angeles

June 19-21, 1962

Material Handling Institute Great Lakes Show
Cobo Hall
Detroit

IT'S A FACT . . . 2 out of 3 truck handling operations can be improved with the proper tire selection!

Monarch takes all the guesswork out of selecting the right tire for every job. Now, famous MONOLOK construction is available in 4 special types and 3 proven treads. Select the particular tire to fit your service requirements in any industrial location under most punishing conditions. Check handy chart and specify tire designed to meet your needs . . . tough smooth-running Mono-Cushion . . . sure-footed Traction . . . all-purpose Universal. Your local Monarch representative will help you make the right selection. Call today or write for Bulletin 457B.

SOLD THROUGH LEADING LIFT TRUCK DEALERS.

NOW ALL 12 GREAT TIRES 3 PROVEN THREADS 4 SPECIAL COMPOUNDS WITH **MONOLOK** PROCESS

TREAD	HEAVY-DUTY	NEOPRENE	NON-MARKING	STATIC CONDUCTING
MONO-CUSHION	Compound T-5100 Provides Maximum Protection Against Metal Scrap Rough Surfaces Heat Chemicals Overloads	Special Compound For Use In High Temperatures Strong Chemicals and Solvents	Eliminates Skid Marks and Smudges on Tile Painted or Decorated Floors	Developed For Use In Hazardous Locations
UNIVERSAL				
TRACTION TREAD				

THE **MONARCH** RUBBER CO.
210 Lincoln Park
Hartville, Ohio

923 Fisher Building
Detroit 2, Michigan

4140 West Fullerton
Chicago, Illinois

Western Warehouse
Reno, Nevada

10285-MR

Circle **80** on Reader Service Card

Destination Portland . . .

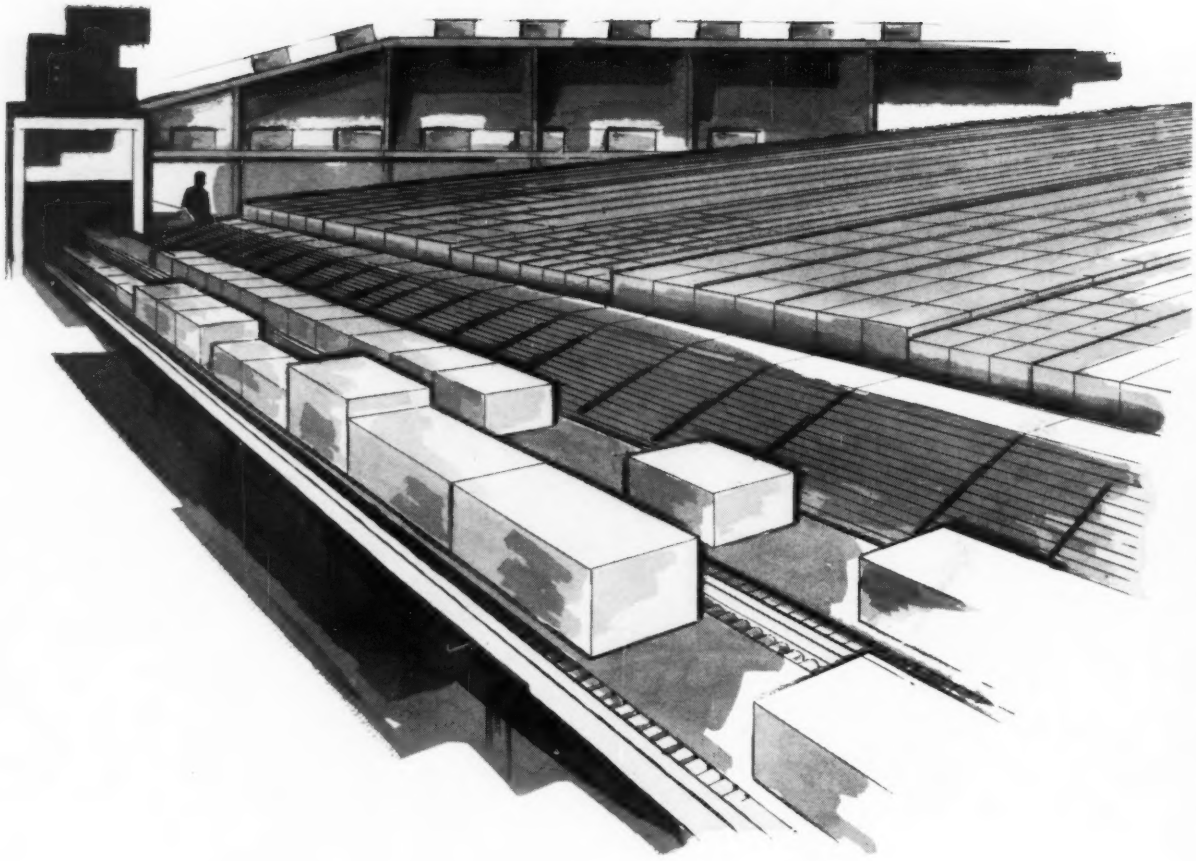
"It's the end of the day. But for these seven Clark trucks it's only the beginning . . . the beginning of a long life of service for five Portland companies.

"They go out of here like this day after day, load after load, to places all over the country . . . places like Oregon, Maine, Florida, California. When a man wants a lift truck that works harder, handles easier and lasts longer, he picks a Clark."

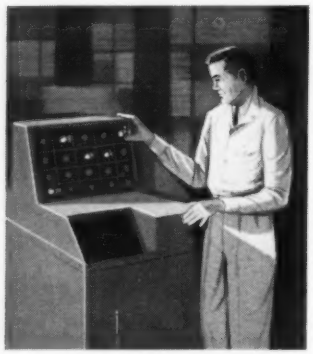
CLARK® EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek, Michigan

For full details,
see your local Clark Dealer
or circle 77 on reader service card



How fast and sure can order-picking be?



AUTOMATE WITH ALVEY AND SEE

No matter how simple or how complex your material handling system, it probably can be automated by Alvey to save you money. Order-picking is one example, but whether you use automatic handling for incoming or outgoing merchandise, parts or finished goods, storage or order filling, Alvey's engineers can suggest time and money-saving ideas.

They coordinate existing equipment, necessary new units and manual handling to any degree required for the most efficient plant and warehouse operation. The most important way to get ahead with more profitable business is to be properly equipped for it. Let Alvey engineers help you get your plans finalized and into operation faster.

Alvey field representatives are conveyor engineering specialists, who can help you decide how to create and produce the most profitable material handling system. Call or write today.

ALVEY'S 50th year ALVEY CONVEYOR MFG. CO.

ALVEY CONVEYOR MANUFACTURING COMPANY

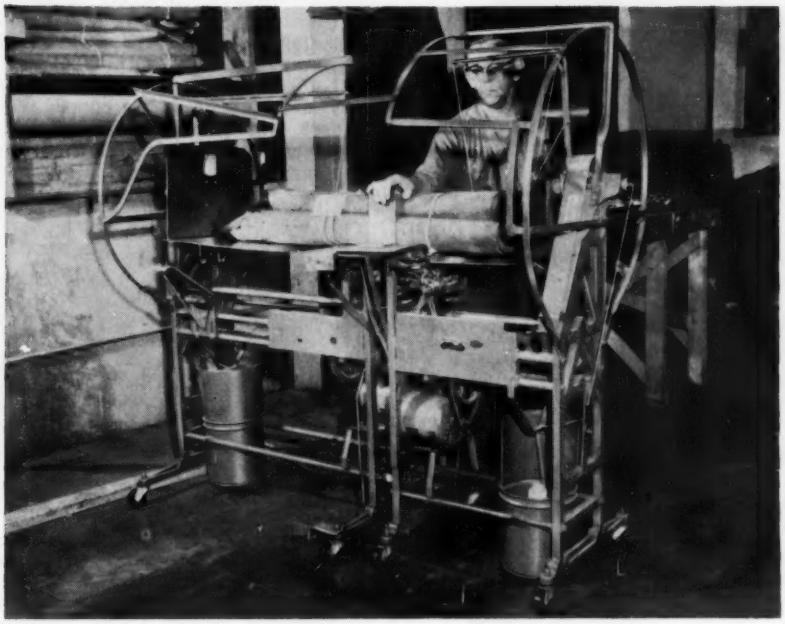
9299 Olive Street Road • St. Louis 32, Mo.

ENGINEERED CONVEYOR SYSTEMS • PALLET LOADERS AND UNLOADERS • VERTICAL LIFT CONVEYORS
ROLLER, BELT, APRON, PUSHER BAR, SPIRAL, AND SLAT CONVEYORS • PACKAGE HANDLING SPECIALTIES

Circle 5 on Reader Service Card

COST CUTTING IDEAS

Tying Costs Cut 25 Percent



Tying a cumbrous bundle of hides is easy for Endicott-Johnson Corporation, shoe makers, Endicott, N.Y. They installed two semi-automatic tying machines. Result: a 25 percent cut in labor requirements, faster handling.

Lynn Arend, shipping room supervisor says, "Where our operation formerly required 4 workers for hand tying, we now need only three. The bundles are tighter, more uniform. This gives us better handling, storage, and keeps our warehouse looking better."

The pieces of leather run as long as 40 inches. This size is impractical to tie with any conventional machine on the market. The operator would have to tie one end, turn the roll, then tie the other end. This is a common way of tying many bundles, but rolls of leather are too heavy and bulky to make it sensible from a time-and-motion standpoint. Each roll has 6 to 10 sides of leather, weighs 52 lb.

Machine isn't custom-made. Management did not want to buy a custom-made machine. Result: they hitched two standard models in tandem. They do the job fine, tying 880 bundles a day.

One of the machines is a 16-inch standard. The other (originally designed for the meat packing industry) is a longthroat model. The machines face one another, end to end. A common pedal works both machines. That way, the tying table accommodates the long rolls, and the machines make both ties at once.

Once a roll is on the table, it only takes 2 to 3 seconds to make both ties. The machine operator steps on the pedal. Two revolving arms carrying twine circle the roll twice. At the end of the second revolution, the twine automatically knots and cuts. The operator removes the roll from the table, sends it on to the warehouse. Splits (smaller pieces of leather) are handled almost the same, except that only one tie is necessary. They average 18 inches in length. They tie the splits on the 16-inch standard. Each bundle has 6 to 8 splits, weighs about 30 lb.

"Despite their weight and the rough handling we give them, the rolls seldom come apart during handling and warehousing", says Arend. "The tying machines automatically put the right tension on the twine. Yet the rolls are easy to take apart on factory arrival. It takes just a pull on the loose end of the knot."—*B. H. Bunn Co.*

Circle **250** on Reader Service Card

Modified Stapler Eases Charcoal Bag Handling

Western Charcoal Corp., Renton, Wash. fastens bags of Quicket charcoal briquets with one-third

the labor since they started using a foot-operated, motor-driven stapling machine instead of manual stapling.

The table, usually part of the machine, has been removed to make it fit directly over the con-

Continued on page 23

OUT-OF-SIGHT

Waste and Refuse Storage for Your Plant

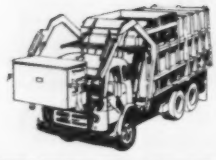
Plant-Owned System or Private Hauler Service Cuts Your Costs... Eliminates Unsightly Trash Piles

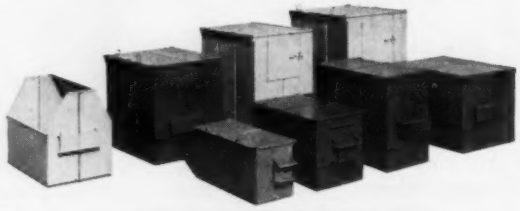
If trash piles, battered cans, scattered refuse, fire hazards and hit-or-miss collection are present in your plant, it may pay you to investigate the DEMPSTER-DUMPMASTER System.

You can own your own system or secure this vital service without capital outlay from one of the many Dumpmaster-equipped private haulers who operate in most major cities.

Clean, big-capacity containers, spotted at refuse accumulation points throughout your plant, provide enclosed, out-of-sight storage for waste and refuse, increasing plant cleanliness and improving employe morale.

Write today for a free brochure that describes this system and the name of your nearest private hauler.





ONE OF THE DEMPSTER DUMPSTER® SYSTEMS

FREE BROCHURE

Write for Name of Your Nearest Private Hauler

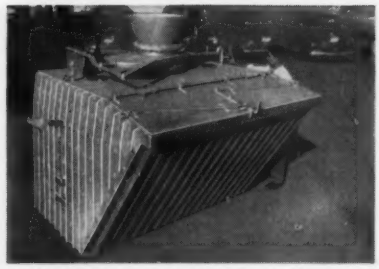
DEMPSTER BROTHERS

Inc.

Dept. MH-8 KNOXVILLE 17, TENNESSEE

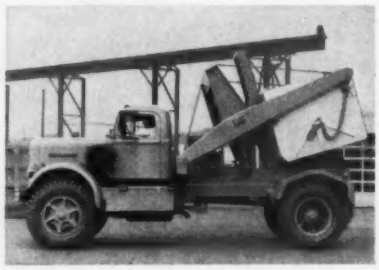
Circle 36 on Reader Service Card

NEW PRODUCTS



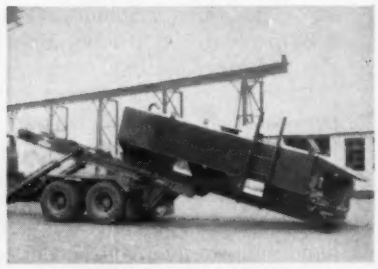
CONTAINER FOR HOT MATERIALS

This 6 cu. yd. tilt-type container was specially built to store and handle a high-temperature dusty product. It has cooling fins, a counter-balanced spring-hinged lid and a 16" sliding gate valve. When full it is picked up, hauled and emptied by a Dempster-Dumpster. Details are contained in a free brochure entitled "Special Containers." Dempster Brothers, Inc., Knoxville 17, Tenn.



NEW LFW HANDLES CONTAINERS

This new LFW 603-C, mounted on a White Mustang, was produced to handle scrap metal storage containers. It will handle containers in capacities up to 15 cu. yds. in all Dempster-Dumpster models. Lifting capacity is 18,000 lbs. Dempster Brothers, Inc., Knoxville, Tenn., offers a catalog brief No. 160 describing this and other materials handling systems.



PORTABLE FUEL OIL TANKS

This 2,000-gallon tank was produced for operation at temperatures as low as −90° F. It features its own pump and gasoline engine. Prime mover is a truck-mounted Dempster-Dinosaur which hydraulically lifts the tank into carrying position and puts it off. A new catalog section No. 12 describes the development. Dempster Brothers, Inc., Knoxville 17, Tenn.

Advertisement

COST CUTTING IDEAS

veyor system. The stapling operator doesn't have to lift or handle the filled bags.

The charcoal made in another part of the plant, rides a conveyor to a central packaging drum. The operator releases it into 10-, 20-, and 40-lb. bags. An automatic scale stops the flow as soon as the right weight is in the bag. Then the open bag moves down the conveyor until it reaches the stapler.

He folds the top of the bag, places an over-flap paperboard handle over the folds, and staples the bag shut with three ¼-in. staples. Both his hands are free to fold the bag top and to hold the folds while the staples are driven. The bag remains upright during stapling. The bags then go on pallets, where they are kept in stock until ready for shipping.

Labor cut one-third. Using the stapling machine, the company reports, has made it possible for three workers to bag, close and attach handles, and load 9,000 bags of charcoal in 14 hours. With manual staplers, it used to take three times as many man-hours to do the same job.—*Bostitch, Inc.*

Circle **251** on Reader Service Card

Rubber Lined Chutes—Hoppers Combat Abrasion

Bonded rubber lining in chutes and hoppers keep coal handling equipment working at the Hagerstown, Md., Municipal Electric Light Plant.

Complex bins and diverters no longer require constant maintenance since they've used the rubber linings. Robert E. Roulette, production superintendent, said the chutes and hoppers originally were made of ¼-inch copper bearing steel. After handling 120,000 tons of coal, the chutes needed extensive repairs.

To extend life of welded repair panels, they used solid stainless steel and stainless clad sheet. This proved too expensive. Then they tried ½-inch rubber blankets over the areas of heavy wear. They then decided to use mild steel chutes with a protective layer of rubber (Plioweld lining material) bonded in place before installation. The test installation was at the main diverter at the head of the conveyor that brings coal into the plant. In 5 months of service, 25,000 tons of coal poured through the chutes with no wear.

Two unexpected benefits: Less noise as coal moves through the chutes; less scattering of coal dust through the plant as the rubber covered flanges on the chutes seal tightly.

Because of the success of the rubber covered chutes, Roulette has ordered new hoppers and chutes in other parts of the coal intake system. Experience shows that steel only half as thick will work if the rubber cushions it.—*The Goodyear Tire & Rubber Co.*

Circle **252** on Reader Service Card

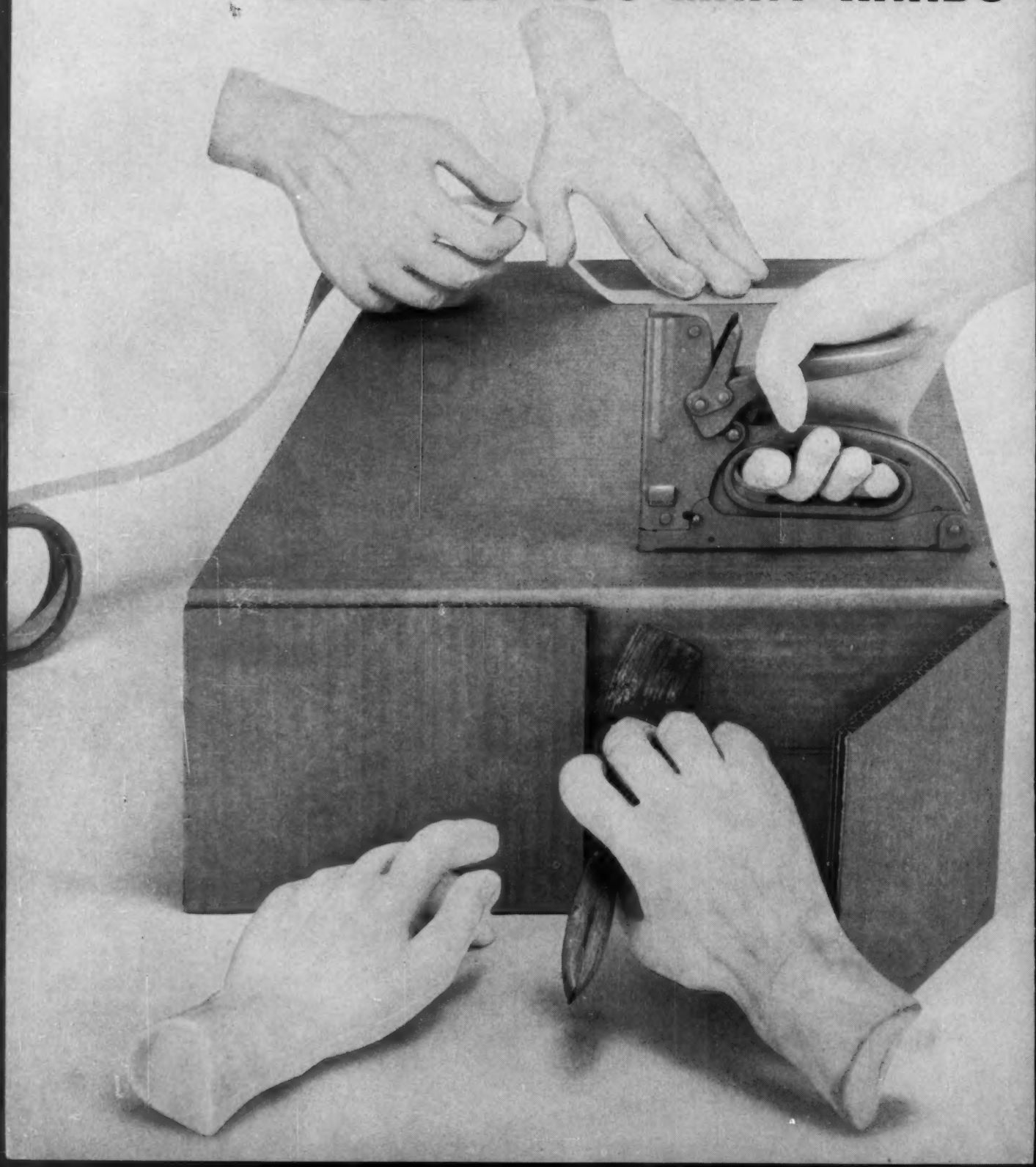
Continued on page 26

10-DAY FREE TRIAL OFFER!
SAVE MUSCLE...
SAVE MONEY!
Laher 'LECTRIC LOADER LIFT
A MUST FOR A 1000 JOBS
LOADING AND UNLOADING—MOVE IT ANY WHERE—NO HOSE OR ELECTRIC CORD ATTACHED. YOU'VE BEEN LOOKING FOR A LIFT THAT IS EASIER TO MANEUVER—that is built so operator can get hold of it—that is lighter in weight and stronger in construction—that handles so easily you will never let go of it once you try it in your plant!
More capacity—2 powerful batteries instead of 1—highest quality battery charger built in—motor, pump, tank, valve, etc. ALL-IN-ONE substantial unit... the finest, most dependable made in America! You'll find competitive equipment clumsy and awkward to handle by comparison to the LAHER Loader Lift!
ORDER NOW—use for 10 full days and, if you aren't 100% sold on the muscle and money saved, you may return it freight prepaid.
PRICE $299.00 UP
LIFT
LAHER SPRING & ELECTRIC CAR CORP.
2615 Magnolia Street, Oakland, Calif. • P.O. Box 731, New Albany, Miss. • 300 Madison Ave., Memphis • 5000 East 40 Terrace, Kansas City • 3041 Olive St., St. Louis • 807 E. 8th St., Los Angeles • 917 Florence St., Fort Worth • 98-12th St., San Francisco • 541 So. State St., Salt Lake City • 714 E. Pike St., Seattle • N.W. 15th and Davis, Portland • 1319 W. Second Ave., Spokane • 1616 L St., Sacramento

Circle **72** on Reader Service Card

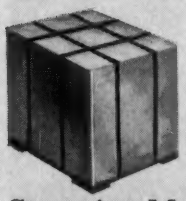
Circle **2** for more information on Acme Steel Co. →

TYING UP TOO MANY HANDS



IN PACKAGING?

Acme Steel mechanized strapping beats any other method hands down!



Too many hands too often strangle the efficiency of a packaging operation. New Acme Steel innovations in mechanized strapping convert wasted motion into concentrated productivity—at the press of a button. By uniformly tensioning, sealing and cutting your steel strapping automatically, Acme Steel Strapping Machines put your operation on a high volume, production line basis. You multiply packaging output without adding a man. In fact, Acme Steel mechanized methods usually *free* busy hands for other assignments.

The secret behind the industry-wide success of Acme Steel mechanized equipment is not only its speed, but remarkable flexibility. Basic machines can be easily adapted to meet virtually any strapping requirement. The result is double savings: 1) You save considerable time and manpower; 2) You save on cost of the equipment itself.

Have your local Acme Idea Man explain exactly how mechanized strapping can most profitably serve you—and pay for itself within months. Or, write for complete details.

ACME STEEL

IDEA LEADER IN

STRAPPING - STITCHING - FRAMING

Acme Steel Company, Dept. MECP-81, 135th St. & Perry Ave., Chicago 27, Ill.

RUPPERT Knickerbocker BREWERY found a dollar-saving difference in A-C LIFT TRUCKS

Chief Machinist Charles Deshensky says, "Our fleet of 19 Allis-Chalmers lift trucks ran 10,500 hours before we took the first engine in for overhaul. Actually, we did it out of curiosity. We wanted to see what made a lift truck engine tick for 10,500 hours. We had never seen one go that long before." Here is what he found:

- Wear on parts throughout — negligible
- Wear on crankshaft — .001" to .0015"
- Wear on sleeves — .0015" to .002"
- Bearings hardly worn. No play in wrist pins.

Your Allis-Chalmers dealer can cite you many such examples. He will also be glad to show you how this dollar-saving difference can work for you. Write for Case Study No. 19 for more details on the Jacob Ruppert story. Allis-Chalmers, Milwaukee 1, Wisconsin. BH-170

ALLIS-CHALMERS

A-C ALLIS-CHALMERS *POWER* FOR A GROWING WORLD

Circle 4 on Reader Service Card

← Circle 2 for more information on Acme Steel Co.

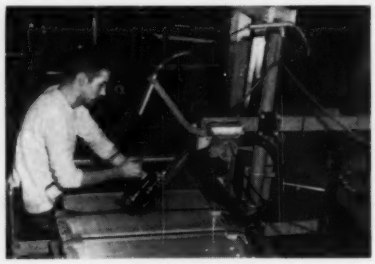
COST CUTTING IDEAS

Powered Steelstrapper Speeds Shipping

Fetter Brothers Aluminum Co., Jeffersonville, Ind. now ships over five times as many combination storm and screen doors as a year ago. One man now easily handles 100 doors in an 8-hour day, more than he was able to ship in a week with their former cumbersome system.

To speed up their packaging, Fetter installed a powered steel strapping station. The station consists of a powered strap feed unit and a powered pneumatic steelstrapper. The only other materials needed: protective corrugated pads and a roller conveyor system.

No helper needed. The steelstrapper works fast. It applies each strap to the same set tension. The man positions the steelstrapper, and presses a throttle. The strap tightens to the right tension. Then it holds the tension while the operator cuts and seals the strap with a hand lever. Seals feed automatically from a magazine that holds 100. The strap feeder enables one man to strap large packages without a helper to pass the strap around the back of the package, or without losing time by going around the back to do it himself.



When the package is in place, the operator inserts the strap end into the feed unit, and operates the control. The strap then passes through the strap track all the way around the package and back to the operator.—*Acme Steel Co.*

Circle 253 on Reader Service Card

Continued on page 28

Meet a Member of the Ground Team at Boeing

Precision and efficiency are essential at Boeing. In material handling, hundreds of thousands of items must move, smooth as silk, through the 603-acre Wichita plant until they emerge on the flight line as a sleek B-52H. A fleet of Allis-Chalmers lift trucks lends a hand on every part of this smooth operation — from receiving dock to flight deck. Their record of performance is convincing evidence that there *is* a Dollar-Saving Difference in Allis-Chalmers lift trucks. Let your dealer tell you about it. Allis-Chalmers, Milwaukee 1, Wisconsin. BH-167

ALLIS-CHALMERS

A-C ALLIS-CHALMERS *POWER* FOR A GROWING WORLD

Circle 8 on Reader Service Card

MATERIAL HANDLING ENGINEERING

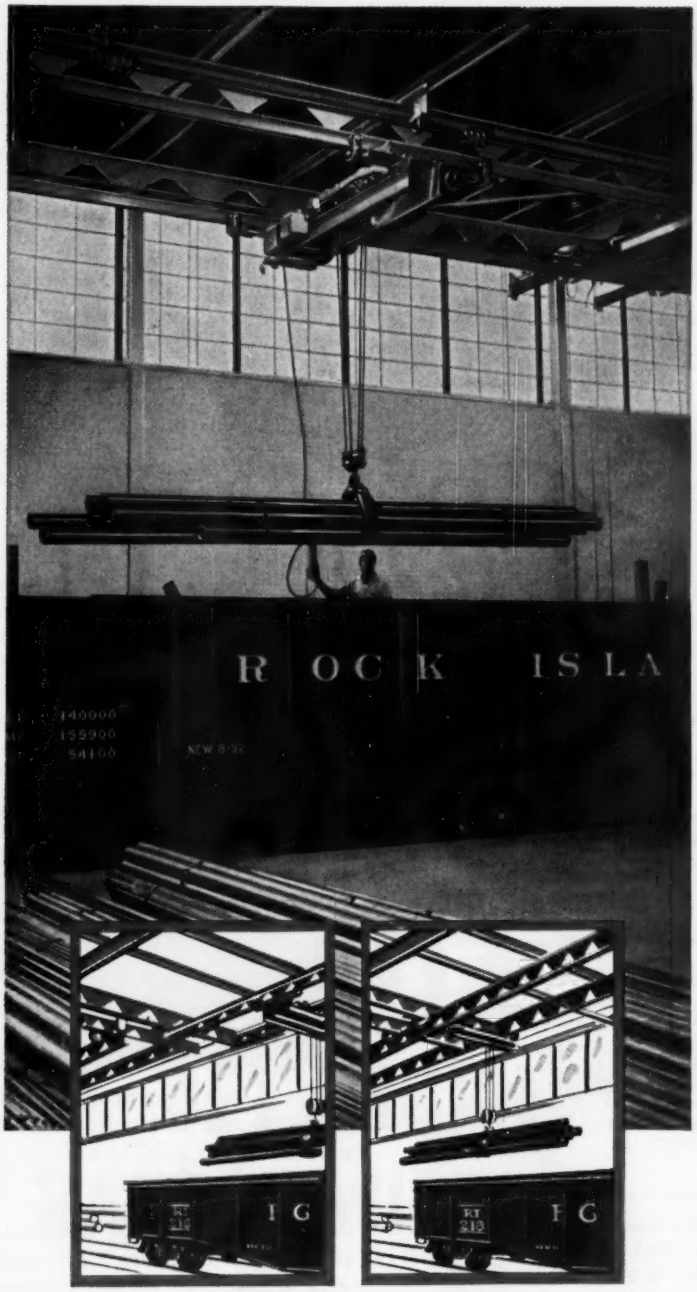


Photo above shows one-man Louden crane unloading ton of tubing. Small sketches show crane aligning with transfer section so load can travel to adjoining crane, without setting load down, to storage in west side of plant.

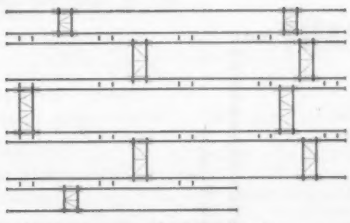


Diagram showing arrangement of overhead crane system. Three aisles of C. A. Roberts warehouse are for storage, two as passageways. Nine Louden Cranes and fifteen transfer sections give complete warehouse coverage. A load can travel to any point without rehandling.

North, South East or West!

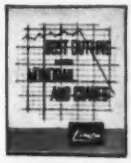
Louden engineered handling again proves it can reduce handling, save space and increase production

Experience shows time and again that the greatest gains in modern materials handling come from *correct* handling engineered to a plant's specific needs. The C. A. Roberts Company, "Steel Tube Specialists" of Franklin Park, Illinois, warehouses steel tubing of every size and length. In its old building, this company had overhead handling but neither integrated nor complete. Excessive rehandling and delay resulted; the company had to maintain a handling force up to 6 men. For its new building, Louden planned and delivered an integrated handling system able to cover every inch of floor space.

"We can move north, south, east or west in our building with Louden equipment, which definitely means more storage space and less handling. We estimate production can be increased up to 100%, and loading-unloading time cut 50%. The Louden bridging system enables us to move tubing from wall to wall with one crane."

A Louden system combines *all* the essentials for satisfaction . . . *the engineering, the experience and the equipment capable of gaining full benefit from the fundamental advantages of overhead handling.* Call on a Louden engineering representative today to help you with your materials handling problem. Your inquiry will receive prompt attention.

NEW. . . 52 pages of illustrated applications . . . industry by industry.



Get the latest and most complete information on planning and equipment selection for the best in modern materials handling. Write today for your copy "COST-CUTTING WITH MONORAIL AND CRANES."

THE LOUDEN MACHINERY COMPANY
813 Broadway, Fairfield, Iowa

A Subsidiary of Mechanical Handling Systems Inc.

Plants in Fairfield, Iowa and Clark, New Jersey

Louden

MONORAIL & CRANES

SINCE 1867 . . . THE FIRST NAME IN MATERIALS HANDLING

Circle **70** on Reader Service Card

4 NEW

Nutting floor trucks

For More Production — Less Effort — Greater Safety

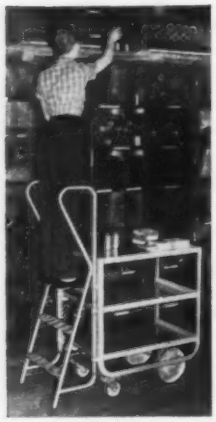


Fig. 912-334

Safe High-Reach Order Picking

Operator's weight depresses spring loaded ladder for braking. Safety tread steps. Forward and side support with cross bar and extended handles.

Easy Packing and Strapping

Grid top for easy passing of strapping beneath cartons. Foot operated stabilizer prevents rolling. Rocker type frame for safe load discharge. Available less wheels.

Fig. 517A

Bigger pay loads with less effort

Especially built for strength without weight, this truck is made of aluminum alloy — structural type to handle heavy loads. Lightweight design means manpower is able to handle more frequent, larger loads.

Fig. 2452 E-AL

Dollar Saving Jack and Skid System

Nutting Hook-'N-Go jacks and skids for mobile storage are low in initial cost . . . eliminate expensive flooring and re-handling . . . provide instant mobility of stored materials. One jack services many skids.

Fig. 2418 Jack

Fig. 422 Skid

These 4 new standard models will boost production with less effort, greater safety . . . based on lighter weight and design for special need. They are examples of many other Nutting standard models for special applications. The Nutting line is complete . . . *over 1,000 standard styles* — thereby, more often than not, saving you the high cost of made-to-order models.

Want more information? Please write — use reader service card or coupon below.

NUTTING TRUCK AND CASTER COMPANY

104 West Division St. — Faribault, Minnesota

Please send literature on:

☐ Fig. 517A ☐ Fig. 912-334 ☐ Fig. 2452E-AL

☐ Fig. 422 and 2418 ☐ Casters

Other for handling_____

☐ Send Catalog 59G, illustrating variety of trucks and casters

NAME AND TITLE_____

COMPANY NAME_____

ADDRESS_____

CITY_____ STATE_____

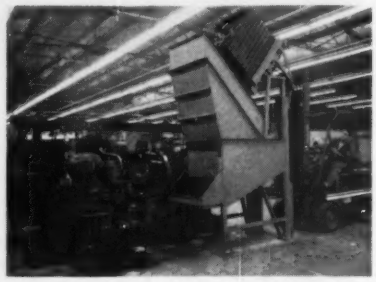
Circle **90** on Reader Service Card

COST CUTTING IDEAS

Box Skids Cut Costs

The handling story at Dresser Manufacturing Division Compression Fitting Plant is heartening. Dresser is a Wellsboro, Pa. maker of compression couplings and fittings, and it saves 10 percent in handling goods in process and a like savings in storage space. And as a bonus, the system keeps an accurate record of finished parts inventory.

Dresser used to have high handling expense and didn't fully use its floor space, because it handled goods in many-sized containers. Then it bought 750 box skids, with tiering brackets and two recessed openings for clamping the skids to a roll-over dumping device on a feed hopper. The hopper



assures an even flow of parts at all production points. Hoppers are 10-gage boxes 30″ x 36″ x 24″.

Dresser handles most parts in these uniform containers and plans to fully equip the plant with them as purchases are made. Dimensions were selected to handle all sizes produced in the general line.

The hoppers:

- Deliver rough parts to production stations for final machining.
- Feed the parts to the machines when used with a hopper.
- Receive parts as they emerge from machines.
- Store parts until they're ready for assembly.
- Deliver parts to assembly.

—Berger Div., Republic Steel Corp.

Circle **254** on Reader Service Card

Continued on page 30

FRAGILE

JET ENGINE HANDLE WITH GO-DEVIL® BY DROTT

When a Jet Engine is pulled for maintenance at this major airport the call goes out for Go-Devil, the only crane capable of hoisting, transporting on its deck, and spotting loads up to 6,000 lbs with the help of its 360° rotating boom.

Here's the one materials handling unit you can count on winter and summer, indoors and out, for the toughest or most precision applications. Front wheel power and rear wheel drive combined with a compact 74" width gets you in and out of the in-plant tight spots. Complete hydraulic controls make for smooth load handling without shock or jar. The unique no-spin differential and deep tread tires take you and the load effortlessly through mud and snow.

If precision, performance and price are your buying yardsticks, put Go-Devil to work today. Its applications are limited only by your imagination. Two models to choose from. The **60** RM2 with a 6,000 lb. lifting capacity and the **20** RM2 with a 2,000 lb. lifting capacity.

IT REACHES	IT LIFTS	IT SWINGS	IT TRAVELS	IT HAULS
24' up . . . 16' out	6000 lbs. with safety	360° continuous rotation	up to 19 MPH	on 50 sq. ft. of deck area

DROTT
MANUFACTURING CORP.
Milwaukee, Wisconsin

CLIP AND MAIL TO

DROTT MANUFACTURING CORP.
Materials Handling Division
3126 S. 27th Street • Milwaukee 15, Wisconsin

I'd like more information on the 60 RM2 Go-Devil.
Please rush bulletin MH602.

Name.....

Title.....

Company Name.....

Company Address.....

City..... Zone..... State.....

Circle **37** on Reader Service Card

SILENT HOIST LIFTRUK

MILL-TYPE TRUCK

OPERATES 24 HOURS PER DAY THROUGHOUT THE YEAR

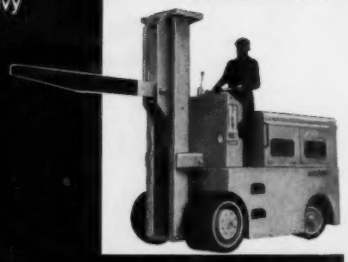
Low Initial Investment

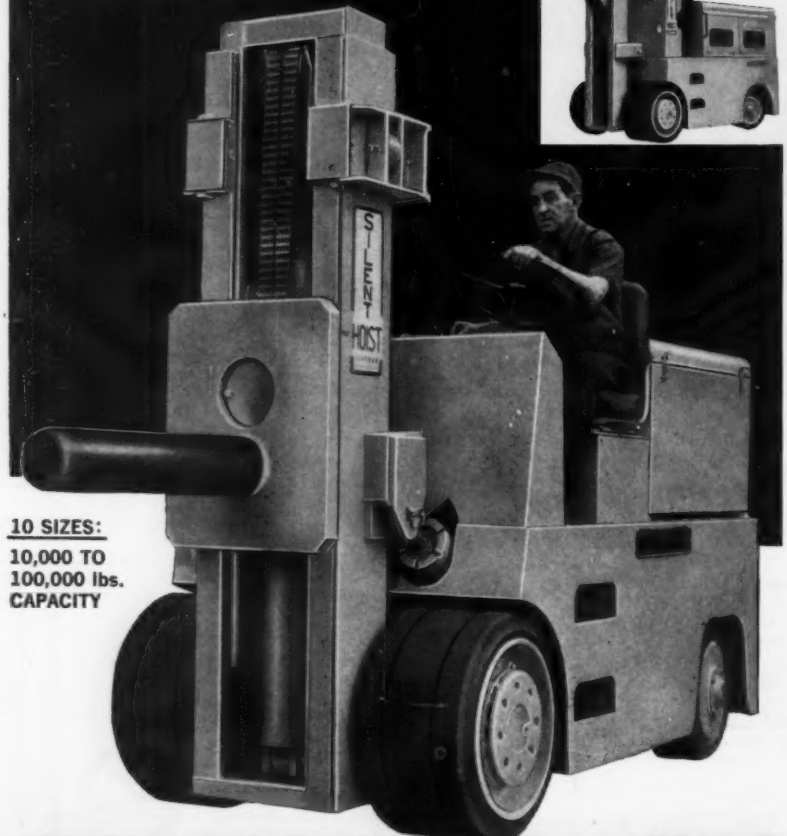
Known affectionately as Big Lug, LIFTRUK is equipped with split-ram or fork tines to give you continuous 24 hour production handling on a plant-wide variety of jobs. Here are a few of the features that put SILENT HOIST LIFTRUK far above "run-of-the-mill" equipment.

- Operates faster and produces more
- Planetary axle
- Automatic Transmission
- Power Steering
- Short turning radius
- Narrow width
- Gas, Diesel, or LP powered
- Unitized chassis and body, heavy steel plate

For complete information on SILENT HOIST LIFTRUK. Write for Bulletin No. 7R today.

Stand up and Sit down models





10 SIZES:
10,000 TO 100,000 lbs. CAPACITY

SILENT HOIST & CRANE CO. · BROOKLYN 20, N.Y.

Circle 109 on Reader Service Card

COST CUTTING IDEAS

Warehouse Doubles Storage Capacity

Midland Cooperatives, Inc., Minneapolis, has a new warehouse for floor-to-ceiling stacking by high-tiering fork trucks. In it they store over twice as much merchandise as they could before in a multi-story building of comparable size.

The new warehouse stores about 12,000 different items: drums and cases of motor oils, tires, automotive accessories, farm supplies, hardware, electrical appliances, and steel.

In an average 3-week period, they move 100,000 gallons of motor oils. Pallets, 36″ x 48″, handle six 15-gallon drums, or four 30-gallon

drums. Fifty-five gallon drums go on 48″ x 48″ pallets.

They stack the pallets 16 feet high. Eight fork trucks keep busy. Some have a triple stage upright. When retracted, the uprights are only 74″ high to permit trucks to work inside highway trailers.—*Clark Equipment Co.*

Circle **255** on Reader Service Card

Rubber Pallet Bands Cut Handling Costs

Giant rubber bands that snap around the top layer of cartons stacked on pallets save one of the country's leading cosmetic manu-

Continued on page 32

FLEXIBILITY

EMI *air-row head pallet racks*

the most flexible,
cost saving and work saving
racks in the industry.

EMI *air-row head DRIVE-IN RACKS*
EMI *air-row head DRIVE-THRU RACKS*

These strong, efficient, space-saving racks are all engineered on the AIR-ROW Head principle with basic interchangeable parts.

EQUIPMENT MFG. INC.

21552 HOOVER ROAD • DETROIT 5, MICHIGAN

Circle 41 on Reader Service Card

Before you build, remodel or add to a storage area, FIND OUT ABOUT AIR-ROW HEAD RACKS

WRITE FOR DETAILED INFORMATION

YOU CAN STACK ANYTHING ON **EMI** RACKS

Tubing for rocker arm shaft ▶
◀ Tubing for chrome trim strip
Cleveland Container
TUBING
protects spare parts of all sizes and kinds

The precision of a rocker arm shaft . . . the mirror finish of a chrome trim strip . . . or *any* delicate part that must remain in perfect condition until used . . . is safeguarded by Cleveland Container tubing. A spirally wound label provides identification.

Correctly designed tubing makes packing simple, handling easy, storage no problem! Best of all—*our made-to-order tubing is available at low unit cost!*

The ends of both tubes shown above are closed with plugs. The plug in one end is inserted in our plant . . . the other after the part is packaged. Tubing for the rocker arm shaft uses metal capped insert plugs which are glued in place. Tubing for the chrome trim strip uses paper plugs which are stapled in place. These are only two examples of numerous applications.

COMPLETE INDUSTRIAL TUBING

We make tubing of every type and size in chipboard, jute or kraft in lengths and wall thicknesses specified. Diameters range from soda straw thinness to 24". For added protection, tubing may be wax impregnated or lined with special greaseproof or anticorrosive papers. Preprinted labels can be furnished for all tubing. ASK OUR NEAREST PLANT FOR A QUOTATION.

THE
CLEVELAND CONTAINER
COMPANY

Plants and Sales Offices: Cleveland, Chicago, Memphis, Dallas, Los Angeles, Plymouth, Wis., Jamesburg, N. J., Greensboro, N. C.

6201 BARBERTON AVE. • CLEVELAND 2, OHIO

ALL-FIBRE CANS • COMBINATION METAL AND PAPER CANS
SPIRALLY WOUND TUBES AND CORES FOR ALL PURPOSES

CLEVELAND CONTAINER CANADA, LIMITED
Plants & Sales Offices: Toronto & Prescott, Ont. • Sales Office: Montreal

Sales Offices: Detroit, New York City, West Hartford, Rochester, N. Y., Washington, D.C.
•
Abrasive Division at Cleveland

Circle **30** on Reader Service Card

COST CUTTING IDEAS

facturers $1,200 a year in labor, damage, and replacement costs.

Helena Rubinstein, Greenvale, N.Y. uses these bands to hold together the top layer of stacks of cartons so they won't slide and topple to the floor when they move pallets.

The bands are 1½ inches wide, 6 feet long, stretch to 18 feet. William J. Armswood, Jr., the purchasing agent, says his company used to use $800 worth of masking tape each year to hold pallet loads steady. "But the tape could be used only once, and often we ripped the cases when we pulled the tape.

"The bands cost $544. We expect them to last about three years. They can be used repeatedly. They're so easy to put on and take off that we estimate they save us $400 a year in labor."—*B.F.Goodrich Industrial Products Co.*

Circle **256** on Reader Service Card

Protective Coverings Guard Arctic Shipment

Waterproof tarpaulins kept a $3.2 million prefabricated nuclear power plant safe and dry on its trip from Buffalo, N.Y., to Camp Century, Greenland.

The covers, made of an 18-oz. vinyl coated nylon, completely covered the nuclear power plant. The plant was mounted on 13 skid assemblies to facilitate Arctic travel. Total weight: 288 tons. The largest single package measured 30′ x 9′ x 9′. The skids were designed as two H-beams, joined by crossties and a top deck.

The fabric was clamped to the bottom of the skids. Certain portions of the equipment projected through the base of the metal skids. Here, they glued the material to the skid to keep out snow and moisture.

The tarps not only withstood the journey satisfactorily, they cut down shipping weight.—*Herculite Protectice Fabrics*

Circle **257** on Reader Service Card

HYSTER

8,000 and 12,000-pound pneumatic tired lift trucks, part of Hyster's complete line of industrial trucks.

DELAYED REPORT

By this time we *should* be able to tell you how long the oil clutch will last in a Hyster industrial truck. We can't. Our problem is that we have been using and testing these clutches for three years, and we haven't worn one out yet!

This type of oil clutch is new to industry—and it's an exclusive feature on Hyster lift trucks. With a lift truck's work day involving hundreds of inch-at-a-time moves, coupled with more backing and filling than a boat making harbor, this rugged, trouble-free clutch solves a long-standing problem.

By cooling the conventional clutch plate in a spray of oil, Hyster has extended clutch life to a measured 10,000 hours—plus! Check *that* figure against other clutches. Then, if you have a material-handling job, call your Hyster dealer. This is the line that sets the engineering pace for all lift trucks.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

NEWEST TRUCKS—NO INVESTMENT HYSTER CUSTOM LEASING PLAN CALL YOUR HYSTER DEALER

HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 • Danville, Illinois

Circle 59 on Reader Service Card

PRODUCT NEWS

Batteries Give Longer Runs

The new TSC Exide-Ironclad battery line has electrical capacity of 85 ampere-hours per positive plate. Man-

ufacturer says this line has the most power per cubic inch now available for electric industrial trucks. No change in battery dimensions. Overall height: still 22⅝ inches without battery tray cover. Design increases the amount of active material in the positive plates and increases the porosity of the square-shaped tubing that holds the active material at the grid spines. The new line comes in 11 standard sizes, from 11 to 33 plates per cell, in capacities ranging from 425 to 1,360 ampere hours.

Exide Industrial Marketing Division The Electric Storage Battery Co.

Circle **301** on Reader Service Card

Two New 2,000-lb. Trucks

SpaceSaver 20 and SpaceSaver 25 are engineered for maximum performance, reliability, driver comfort in a small, highly maneuverable lift truck.

Company claims less driver fatigue, more production per shift. Trucks include Monotrol (forward-reverse and throttle control in right-foot pedal). Other features: dashboard drive and park pushbuttons, automatic parking brake, full-flow hydraulic oil filter, dry-type engine air filter, cushion tires. The SpaceSaver 25—identical in performance characteristics to the 20—takes 2,500 lb. loads at 24-inch load centers, also handles a full 2,000-lb. load with a wide range of attachments.

Hyster Company

Circle **302** on Reader Service Card

Light, One-Man Ramp

Port-A-Ramp comes in load capacities of 1,000 to 1,500 lb., lengths of 7 to 16 ft. It's light, easily handled

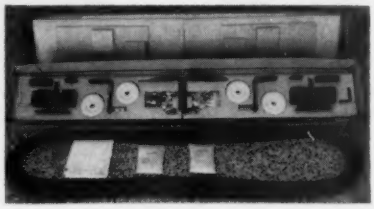
by one man, can be carried right in a truck. Specially recommended for areas without docks or where the docks are limited. Double thick end plates beef up areas of greatest abuse. Ramp has non-skid walkway. Ramp also good for inplant moving of material and equipment between levels.

Brooks & Perkins Inc.

Circle **303** on Reader Service Card

Attachment Installation Kits

Two hydraulic hose adaption kits simplify the field installation of fork truck attachments on Clarklift gas and electric trucks. Two-hose and four-hose units are now off-the-shelf items in sales and service outlets. Kits include: 45 or 90 feet of hose, hose end fittings, brackets, sheaves and guide rods necessary to make a complete connection between the auxiliary valve and terminal point on the truck's fork carriage. Standard, Hi-Lo, and triple stage uprights use the same kit. Each kit has enough material to



make an installation on any upright not exceeding 180 inches maximum fork height.

Clark Equipment Co.

Circle **304** on Reader Service Card

Add-Subtract Controllers

Get direct reading numerical indication of bi-directional counting or measuring, work machine controls automatically when preset numbers are reached. These are some of the things you can do with this line of Add-Subtract Digital Process Controllers. You can preset numbers by panel knobs, or remotely by punched tape, magnetic tape, punched cards. The

controllers work with a wide range of production and processing equipment, such as cutting to length, positioning, balancing, coil winding.

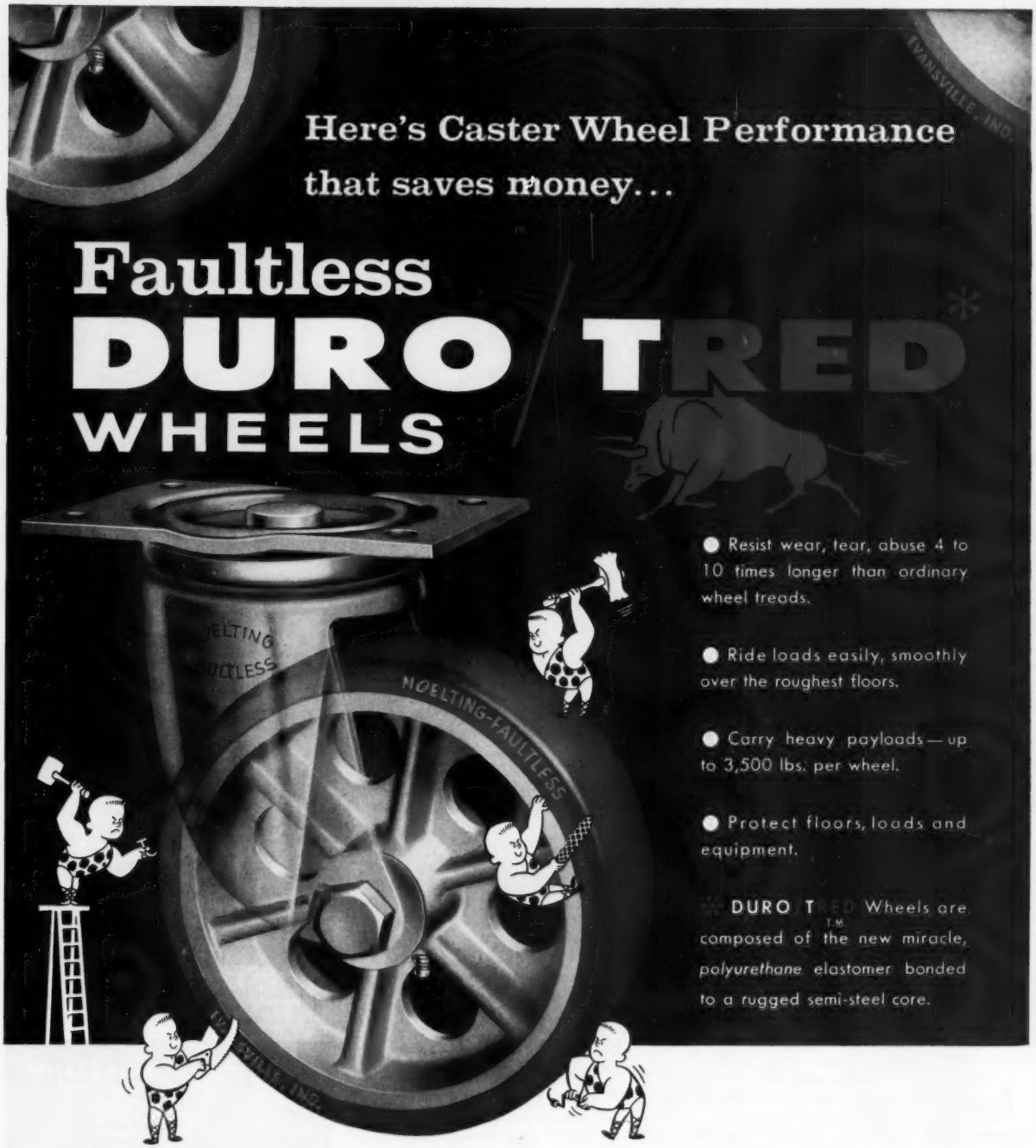
Dynapar Corp., subsidiary of The Louis Allis Co.

Circle **305** on Reader Service Card

Rail Car Retaining Strips

Easy-to-install paper retaining strip prevents slippage of products into storm doorways. Strips have no steel bands, require no special tools. Made of heavy-duty extensible Kraft

Continued on page 36


Here's Caster Wheel Performance
that saves money...
Faultless
DURO TRED
WHEELS
● Resist wear, tear, abuse 4 to 10 times longer than ordinary wheel treads.
● Ride loads easily, smoothly over the roughest floors.
● Carry heavy payloads — up to 3,500 lbs. per wheel.
● Protect floors, loads and equipment.
DURO TRED™ Wheels are composed of the new miracle, *polyurethane* elastomer bonded to a rugged semi-steel core.
NOELTING-FAULTLESS
EVANSVILLE, IND.

With Duro/Tred Wheels, your caster maintenance costs can be chopped considerably. Special properties of *polyurethane*—strength, resilience, wearing quality—mean Faultless Duro/Tred Wheels cut costly downtime of castered equipment in your plant. New Faultless Duro/Tred Wheels are manufactured in 5", 6", 8", 10" and 12" diameter wheel sizes to fit most larger Faultless swivel and rigid industrial casters. *Free,* fact-filled literature sheet detailing specifications and sizes of Duro/Tred Wheels is available from Faultless or your local Faultless Industrial Distributor, who stocks a wide range of casters at his warehouse for immediate shipment.

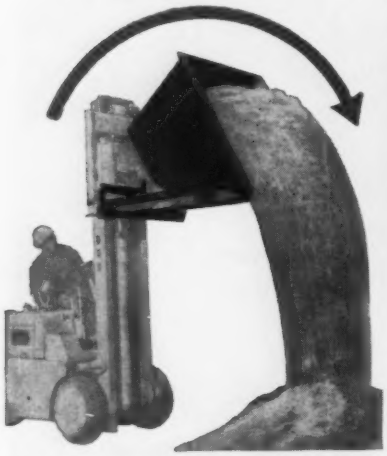
Faultless Caster Corporation
EVANSVILLE 7, INDIANA

Branch Offices in principal cities; see the Yellow Pages of the telephone book under "Casters." Canada: Stratford, Ontario.

Circle 46 on Reader Service Card

NOELTING Faultless Casters

FITS ANY LIFT TRUCK DUMPS AUTOMATICALLY



CAN CUT HANDLING COSTS 50%

With this self-dumping hopper on your lift truck, one man can do the work of two—in a fraction of the usual time. It's the modern, low-cost way to handle scrap metal, small castings, cinders, punch press parts, hot forgings, cullet—all kinds of bulk material.

DUMPS ITSELF

RIGHTS ITSELF

LOCKS ITSELF

Attaches in seconds to any lift truck—fork or platform. Can't slip off. Operator picks up loaded Hopper—transports it to its destination—releases the latch—and the Hopper automatically dumps its load, rights itself, locks itself.

Roura Hoppers are sturdily made of 3/16" steel plate with continuous arc-welded seams. Heavier plate if desired, also stainless steel or galvanized. Made in eight sizes, 1/8 to 4 yard capacities, mounted on live skids or a choice of wheels. Standard models available for immediate shipment.

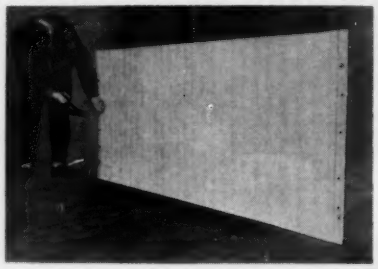
ROURA
Self-Dumping
HOPPER

WANT MORE DETAILS? Just clip this coupon to your letterhead and mail to
ROURA IRON WORKS, INC.
1411 Woodland Ave., Detroit 11, Michigan

Circle 105 on Reader Service Card

PRODUCT NEWS

paper reinforced with Fiberglas scrim and rovings. You nail them to the car wall about 6 inches from each



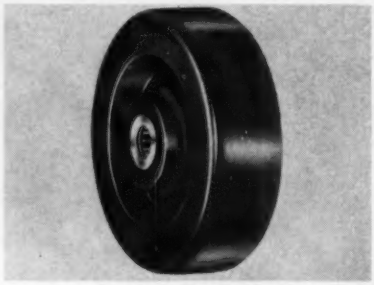
side of the doorway. Ship-Safe strips come 25 to a package for six-through ten-foot doorways in heights of two and three feet.

Bemis Bro. Bag Co.

Circle **306** on Reader Service Card

Water Resistant Wheels

New water resistant wheels are quiet, longwearing, easy-rolling, and protect the floors. Specially molded for unusual water or chemical resistance. These Texite wheels come in practical sizes from 3¼ to 16 inches in diameter, tread widths from 1½ to 4 inches, capacities up to 8,000 lb. You can get them with plain, roller, or sealed bearings, in complete swivel



or rigid casters. Priced same as regular Texite wheels in line.

Albion Industries Inc.

Circle **307** on Reader Service Card

Utility Vehicles: 1961 Models

Greater range of power and more versatility are features of the 1962 line of gasoline and electric-powered Cushman Trucksters. Up to twice the horsepower of previous units is now provided. The gasoline-powered 780 series is similar in basic chassis design to last year's units, but extensive internal changes have

Continued on page 39

3 WAYS BETTER

ALBION'S NEW SERIES 16 CASTERS

Another completely new . . . completely practical Albion industrial caster series developed to serve a broader variety of applications. Conservatively rated as **medium duty** casters, yet constructed for longer, better . . . heavy duty, maintenance-free service. They're three ways better, and here's why:

1. MORE CAPACITY

The new Series 16 Casters offer Albion's finest, most dependable construction advantages such as "cold-formed" steel yoke base and top plate with heat-treated raceways for smoother, lasting maneuverability under greater capacity loadings.

2. MORE WEARABILITY

Albion's Series 16 Casters are available in nine different high capacity or floor protective wheel types in diameters of 3½" to 8" with a capacity range of 140 to 900 lbs. per wheel. Sound engineering, quality materials and craftsmanship plus Albion's many outstanding construction features are combined to afford a caster that will last and last and last.

3. LESS COST

Although built to Albion's exacting quality standards, the Series 16 cost you far less than most ordinary casters of the same size or capacity ratings. And . . . they are available—all models—right now!

RIGID CASTERS
Albion's Series 16 Casters are available as matching rigid models in 9 wheel types—3¼ to 8 wheel diameters.

Remember . . . if you want longer, better service plus caster versatility at a savings you can count—be sure to get all the facts and figures from Albion.

Write—wire or phone today for your copy of the new illustrated specification sheet on Albion Series 16 Casters.

ALBION INDUSTRIES, INC.
Albion Michigan

Circle 3 on Reader Service Card

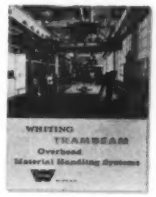
Circle 128

TRAMBEAM® CUTS COSTS BY KEEPING PRODUCTS *ON TRACK*

Here's how The Louis Allis Company—a major motor manufacturer—handles varnish coating of massive stators and stator coils. Units come into the dip tank section shown above from any one of a battery of ovens and from any other part of the plant.

Two transfer cranes, one with a lift section, and connecting spur tracks interlock the entire area into a smoothly operating, trouble-free materials handling unit. No manual, time consuming re-handling of material is required. The product is always ON TRACK with Trambeam.

Trambeam is completely compatible with all other methods of materials handling. Why not have a Whiting man tell you how it can cut costs by reducing wasted effort in your plant? Write: Whiting Corporation, 15659 Lathrop Ave., Harvey, Ill. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.



Ask for your copy of Whiting's latest Trambeam bulletin—M-34

See our catalog in Sweets

90 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

TRAMBEAM®

WHITING®

MANUFACTURERS OF CRANES; TRAMBEAM® HANDLING SYSTEMS; PRESSUREGRIP; TRACKMOBILES®; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL PROCESSING EQUIPMENT

MATERIALS-HANDLING NEWS

NEW AND UNUSUAL APPLICATIONS OF BASSICK CASTERS THAT MIGHT BE ADAPTED TO YOUR HANDLING PROBLEMS

CASTERS HELP FEED ROBOTS

in first fully automated U.S. Post Office

The latest, most advanced mail-handling devices in the U. S. are at the new "automatic" Post Office in Providence, R.I.

But hard-working Postal employees *still* have to move mountains of mail to the machines—and deliver it after processing. And that's where Bassick casters come in.

Mail sacks move quickly and easily through the Providence Post Office on this Towveyor . . . on reliable Bassick "S99" swivel and "S98" rigid casters.

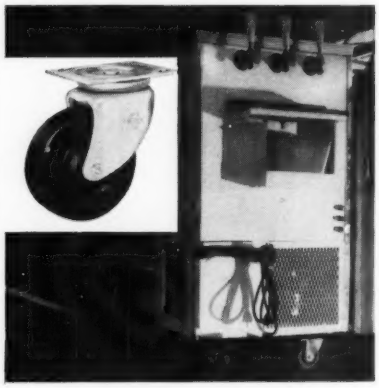
These heavy-duty casters are built to take the abuse of power-pulled applications at all Towveyor speeds. They come in 3″, 5″, 6″, 8″, and 10″ sizes with a broad selection of wheel types. Strong, extra-heavy-gauge steel. Ideal for dollies, assembly fixtures, and warehouse trucks as well as draglines.

Blind Spot in History

Before Columbus, wheels—so important to modern life—were known only as toys, like this Aztec plaything, to the Indians of America. It was a thousand years after this toy was made before these early Americans used the "wheel" for practical purposes.

SMOOTH ROLLING ROTOGRAVURE

One of the world's largest printing companies uses these special dollies to transport rotogravure cylinders safely to the presses. Featured here are Bassick "Floating Hub" casters—the casters with built-in shock absorbers. "Floating Hubs" eliminate bounce and caster shimmy, and aid in "climbing" over minor floor obstacles. They're ideal for handling a wide variety of delicate equipment and fragile products.



BASSICKS HELP BEAT THE HEAT HERE

This mobile beverage cooler and dispenser goes where it's needed on easy rolling, easy swiveling Bassick casters.

The Bassick "Qualecon" casters used here feature maximum caster quality at minimum cost. Recommended for hundreds of other medium-duty applications, too.

CAUGHT IN A "PROFIT-SQUEEZE"?

Switch to Bassick casters and cut a big slice out of materials-handling costs—said to amount to 30% in the average manufacturing plant.

You'll save on decreased maintenance for casters, equipment and floors. What's more, Bassick casters roll and swivel so easily they make a real hit with operating personnel.

THE MAN TO SEE

. . . is your distributor who carries Bassick casters. He has a wide range of caster sizes and types in stock for fast delivery. He can help you select the right caster for your job. 1.42

THE BASSICK COMPANY
BRIDGEPORT 5, CONN.
IN CANADA:
BELLEVILLE, ONT.

see our catalog in Sweet's or write for copy

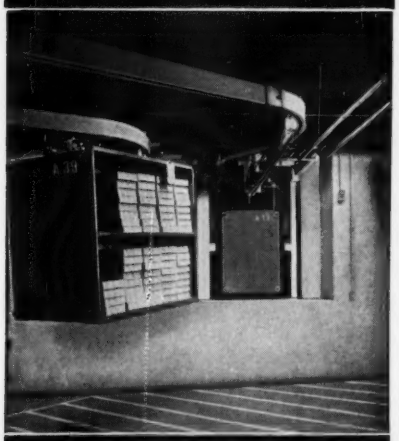
Symbol of SW Excellence

Bassick
A DIVISION OF
STEWART-WARNER CORPORATION

Circle 12 on Reader Service Card

Power -Flex®

POWER AND FREE
OVERHEAD CONVEYOR SYSTEM*



WITH TELEMATIC
AUTOMATIC DISPATCH CONTROL

• *Simply set dials and Telematic guides carrier to any station in system*

Employs exclusive unitized "over and under" power and free rail which permits simple switching to right or left as desired.

Power-Flex is designed for automated materials forwarding applications in industrial plants, distribution centers, service buildings and department stores. The most economical system available for loads up to 600 lbs. per carrier. Savings in actual installations range from 25% to 60%.
* Systems in service for your inspection.

Engineered to your very specific requirements.

SEND FOR BROCHURE

Inquiries from your engineers or consultants welcomed.

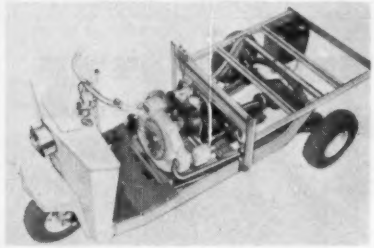
CM CONVEYORS

COLUMBUS McKINNON CORPORATION
Conveyor Division
TONAWANDA, N Y

Circle **27** on Reader Service Card

PRODUCT NEWS

been made with new power plants. Cutaway view of basic model 780 shows mounting of the new Twin Super Husky engine. Engines are die-cast aluminum for light weight and fast cooling, have overhead valves, full pressure lubrication system, 4-cycle operation and an alternator rather than a generator. Other mechanical modifications include: new 12-volt electrical system, improved



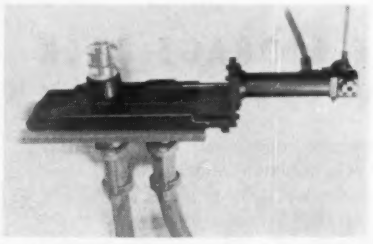
automative-type transmission, mounting of the gear shift on the steering column, a new torsion bar stabilizer for the semi-elliptical rear spring suspension, an improved automotive type differential, and easier braking on all three wheels. The two- and five-passenger models of the electric-powered Trucksters have a front fork link for easier steering and aircraft shock absorbers for smoother riding as 1962 improvements.

Cushman Motors

Circle **308** on Reader Service Card

A New Line Diverter

Air convey powdered or granular material more efficiently at less cost



with a line diverter. The Flo-Seal Line Diverter permits you to select quickly one of two conveying lines without interference or restriction within the line. You can get the unit in cast iron or stainless steel. It's self-cleaning, meets sanitary codes of the food industry. Requires no lubricants. Easily disassembled for inspection, servicing. Adjust speed with two screws.

Flo-Tronics Inc.

Circle **309** on Reader Service Card

Continued on page 40

It's the
ATTACHMENT
that handles your
DRUMS

PICKS THEM UP!
CARRIES THEM!
SETS THEM DOWN!

It's the ATTACHMENT that does the work. The truck provides the power.

LITTLE GIANT ATTACHMENTS are:
- simple in design
- strong in construction
- low in maintenance cost.

LITTLE GIANT ATTACHMENTS fit any make, model or size of lift truck, lift tractor, walkie or stacker crane.

Insist upon LITTLE GIANT GRIP-O-MATIC with *hardened* gripper jaws — accept no substitute. Every LITTLE GIANT ATTACHMENT carries a money back guarantee.

Phone Earl Wallace at Peoria 673-4515 and tell him YOUR problem.

For brochure on entire line Circle # 140
For brochure on Grip-O-Matic Circle #71

LITTLE GIANT®
LIFT TRUCK ATTACHMENTS

LITTLE GIANT PRODUCTS, INC.
1530-50 N.E. Adams St., Peoria, Ill.
Established 1918

Circle **71** on Reader Service Card

PRODUCT NEWS

Makes Opening Easy, Quick

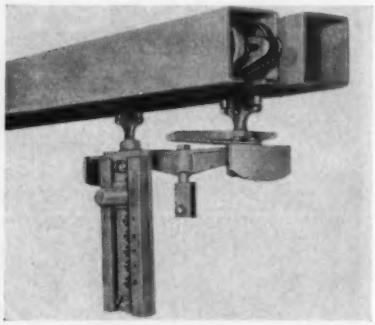
Non-asphaltic reinforced sealing tapes pull open easily and quickly. Golden Quick-Strip Snaketape and Glaspun include a new non-staining laminant. Won't bleed at high temperatures, nor become brittle below zero. Company offers at low price.

Ludlow Papers

Circle **310** on Reader Service Card

Automatic Chain Conveying

Get automatic movement of parts with the Twin-Trak chain conveyor. It's an automatic dispatch system that enables you to move material from place to place, in and out of storage. The system uses one or more power tracks and as many storage tracks as needed. Workers program the carriers (photo) although you can also get electrically controlled or fixed program carriers. Escapement switches permit material to leave the storage lines only when an empty dog passes. Feed in switches send carriers from powered sections to storage lines or other powered sections.



Richards-Wilcox Mfg. Co.

Circle **311** on Reader Service Card

Specify **KEYRACK**

RUGGED, 2-PIECE STORAGE RACK WITH BUILT-IN SAFETY LOCK*

An engineering achievement in storage racks. Now you can easily erect a storage rack in your plant with minimum effort and maximum use of cubic area. Safety locking device automatically snaps into position affording protection against accidental impact by lift trucks or equipment. Just tap into place (see insert) you do not have to touch the lock. Observe the positive locking action! All Keyracks are provided with heavy gauge channel bracing.

OTHER PRODUCTS OF STORACK CORP.

STORACK — A metal bolted framing rack, for the exceptional storage application.

RACKS THAT STACK — Specially designed for coils, bar stock and pipes.

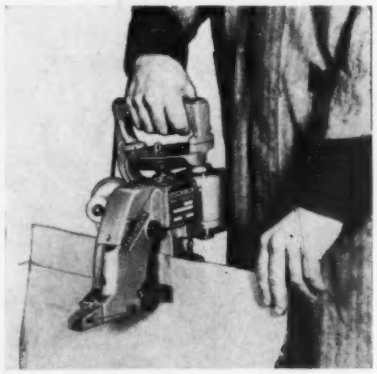
*PATENT APPLIED FOR

STORACK CORPORATION
2100 GREENWOOD ST. • EVANSTON, ILLINOIS

Circle **112** on Reader Service Card

Portable Bag Closer

Fischbein Model D stresses simplicity of operation. Even an inexperienced operator can use it to close



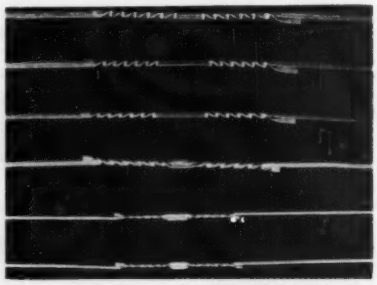
all types and thicknesses of textile and paper bags. Can be used as a completely portable unit, or in one position with specially designed suspension units. Operates with a Fischbein Faseal taping attachment when tape bound closures are required.

Dave Fischbein Co.

Circle **312** on Reader Service Card

Save on Strapping Costs

You can get a flattened, galvanized process wire, Ribbostrap, for packaging and handling. Company says it's up to 30 percent cheaper. Has



STANDARDIZE–

ECONOMIZE–

...WITH

DARNELL

CASTERS & WHEELS

the Ultimate in Performance

There is a type of Darnell Caster or Wheel for every kind of use and floor. Made for light, medium and heavy-duty service, you are sure to find in the Darnell line the exact caster or wheel to meet your individual requirements . . . Ask your distributor for your copy of the new 192 page Darnell Manual

DARNELL CORPORATION, LTD.
DOWNEY (Los Angeles County) CALIF.
37-28 SIXTY-FIRST, WOODSIDE 77, L.I., N.Y.
36 NORTH CLINTON ST., CHICAGO 6, ILL.
1000 PEACHTREE N. E., ATLANTA, GA.

Circle **35** on Reader Service Card

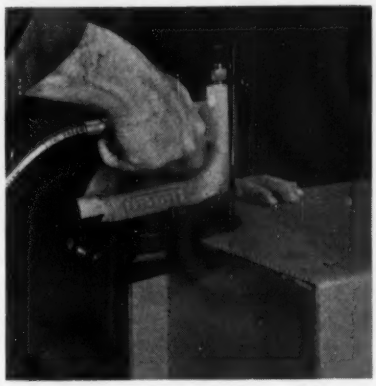
high tensile strength, light weight. Eliminates need for joint seals. Speeds up strapping operations. Smooth, rounded edges make it safe, easy to handle. Comes in five gages, for softest cartons to rigid boxes and crates.

Strapping Materials Co.

Circle **313** on Reader Service Card

Air-Driven Stapling Plier

Stapling plier has deep throat for placing staples up to 4¾ in. from edge of work. Fast, efficient for stapling recessed-end cartons, telescoping containers, corrugated wrappings, bags, shipping envelopes. Jaw clearance up to 15/16 in. at clincher. Model T21P weighs only 4 lb., holds 210 staples, easily operated with one hand. Re-



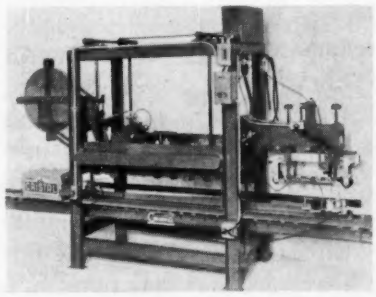
loads fast. Operates on 45 to 90 p.s.i. air supply, depending on material stapled.

Bostitch, Inc.

Circle **314** on Reader Service Card

Tapes, Seals 30 Cases a Minute

Run your conveyor right through T.S. S-10 taper-sealer, and it auto-



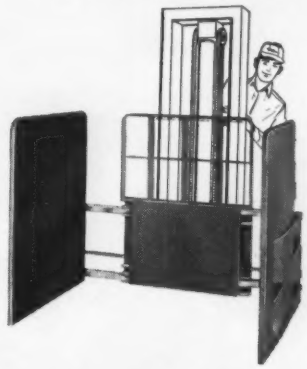
matically tapes and seals flaps of your corrugated shipping containers as they pass through. Closes 30 cases a minute. Adjustable for different box sizes.

General Corrugated Machinery Co., Inc.

Circle **315** on Reader Service Card

Continued on page 43

It's the
ATTACHMENT
that handles your
CARTONS



PICKS THEM UP!
SIDE SHIFTS THEM!
SETS THEM DOWN!

It's the ATTACHMENT that does the work. The truck provides the power.

LITTLE GIANT ATTACHMENTS are:
- simple in design
- strong in construction
- low in maintenance cost.

LITTLE GIANT ATTACHMENTS fit any make, model or size of lift truck, lift tractor, walkie or stacker crane.

Insist upon LITTLE GIANT HIGH BODY CARTON CLAMPS with *case hardened rectangular* slide bars — accept no substitute. Every LITTLE GIANT ATTACHMENT carries a money back guarantee.

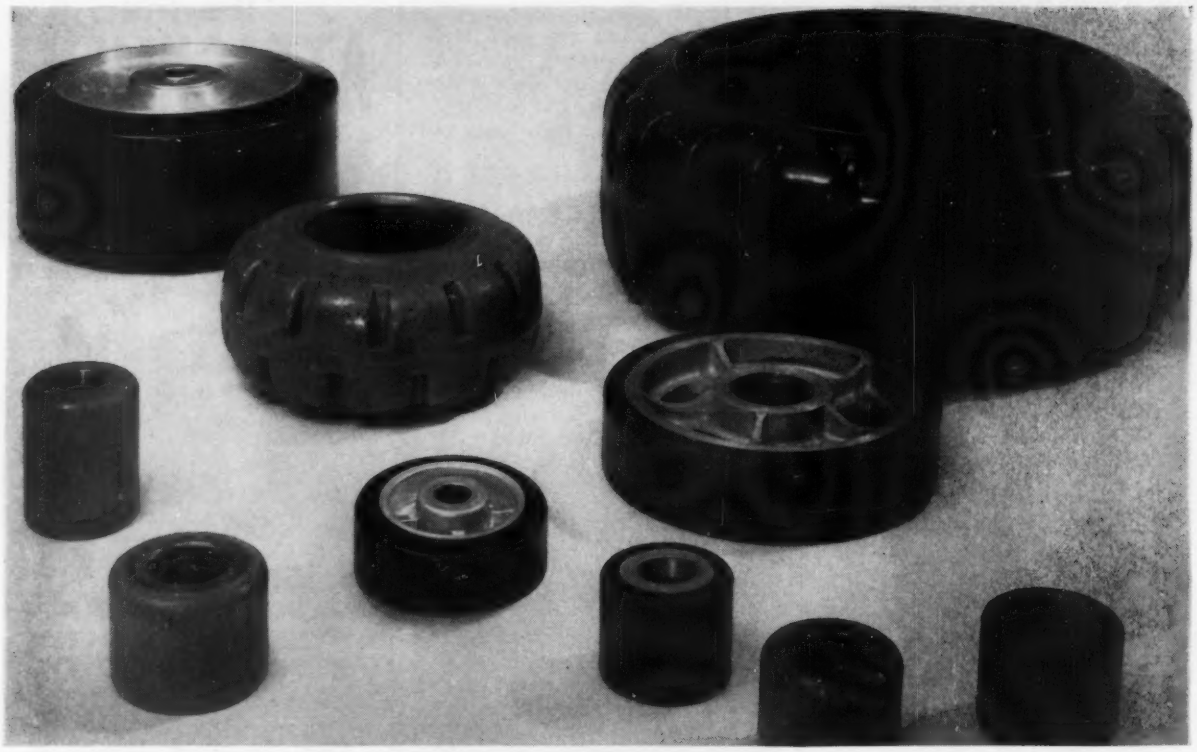
Phone Earl Wallace at Peoria 673-4515 and tell him YOUR problem.

For brochure on entire line Circle # 140
For brochure on Carton Clamps Circle #68

LITTLE GIANT®
LIFT TRUCK ATTACHMENTS

LITTLE GIANT PRODUCTS, INC.
1530-50 N.E. Adams St., Peoria, Ill.
Established 1918

Circle **68** on Reader Service Card



For Heavy-duty Industrial Wheels...

ADIPRENE® Outlasts Other Materials, Carries Heavier Loads at Lower Cost!

These wheels are just a few of the many, many types currently being made from Du Pont ADIPRENE—the quality urethane elastomer designed to give long, economical service under conditions where rubber and other materials fail rapidly. Solid tires, caster and pallet wheels made from ADIPRENE carry far heavier loads; outlast conventional rubber wheels many times over. Yet they're resilient; won't mar floors.

ADIPRENE polymers combine resilience with high hardness and load-bearing capacity... give wheels the ability to carry heavy loads without chipping, gouging or chunking. They offer outstanding resistance to abrasion and impact, withstand attack by oil, grease, ozone, oxygen, salt solutions and dilute mineral acids. They also perform well at low temperatures (brittle point is below -80° F.).

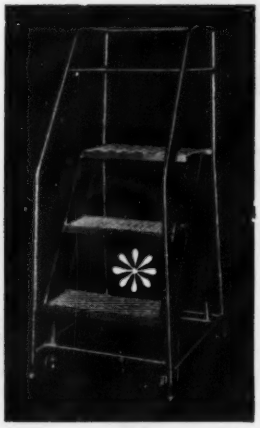
ADIPRENE wheels are now available in a wide range of sizes and types from leading manufacturers throughout the country. Learn how this new Du Pont elastomer can help you increase efficiency and reduce maintenance costs in your plant.

Write for full information and a list of suppliers to: E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Department MHE-8, Wilmington 98, Delaware.

DU PONT ADIPRENE® URETHANE RUBBER

Better Things for Better Living . . . *through Chemistry*

Circle **38** on Reader Service Card



LOW C. G.

—more safety

BALLYMORE

Safety-Step

LADDERS

Just as today's cars feature a low "c.g." for on-the-road safety, so Ballymore ladders feature a low "c.g." for all-level safety. The safe, wide-base pyramid design with a low center of gravity gives a new stability even at heights up to 15 feet.

Sturdily welded, corrosion-resistant steel and aluminum Ballymore ladders are mobile and can be moved easily on casters to any area. Simple tip-toe pressure anchors the rubber tipped feet to the floor and securely positions the ladder.

WITH OR WITHOUT HANDRAILS

For illustrated catalog covering complete line, write to

BALLYMORE COMPANY, WEST CHESTER 5, PA.

BALLYMORE

EQUIPMENT FOR WORKING *Safely* ABOVE FLOOR LEVEL

Call your LOCAL DISTRIBUTOR

Circle 11 on Reader Service Card

PRODUCT NEWS

Bags Zip Open

Pull red tab, you zip open sewn valve or open-mouth shipping bag. Tab is on factory-closed end of bag, usually at top; you fill other end. Can be partially opened to form filling spout, or completely opened. Before use tab is stitched to seam, cannot open by accident. Designed so loose threads do not contaminate product, and clean opening permits re-use of bag.

Bemis Bro. Bag Co.

Circle 316 on Reader Service Card

Velvet Grip Protects Products

Liftex nylon webbing slings protect highly finished materials or fragile

products. Special grip and careful handling protects stainless steel, aluminum coils, or smooth finished ground toolsteel and drill rod. Slings come in varied lengths and widths for all applications. Illustration shows a sling handling a bulk load of raw steel in a grinding plant where loads up to 100,000 lb. are handled with care. Features: handling ease, lightweight, fast accessibility around bulky items.

Liftex Slings, Inc.

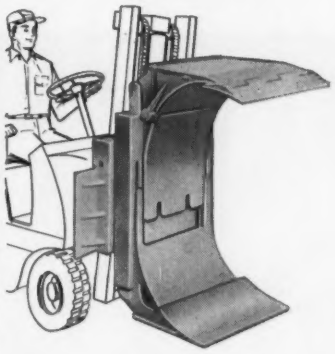
Circle 317 on Reader Service Card

For more PRODUCT NEWS turn to page 82

It's the

ATTACHMENT

that handles your ROLLS



PICKS THEM UP!
ROTATES THEM!
SETS THEM DOWN!

It's the ATTACHMENT that does the work. The truck provides the power.

LITTLE GIANT ATTACHMENTS are:

- simple in design
- strong in construction
- low in maintenance cost.

LITTLE GIANT ATTACHMENTS fit any make, model or size of lift truck, lift tractor, walkie or stacker crane.

Insist upon LITTLE GIANT ROTATING ROLL CLAMPS with *case hardened rectangular* slide bars — accept no substitute. Every LITTLE GIANT ATTACHMENT carries a money back guarantee.

Phone Earl Wallace at Peoria 673-4515 and tell him YOUR problem.

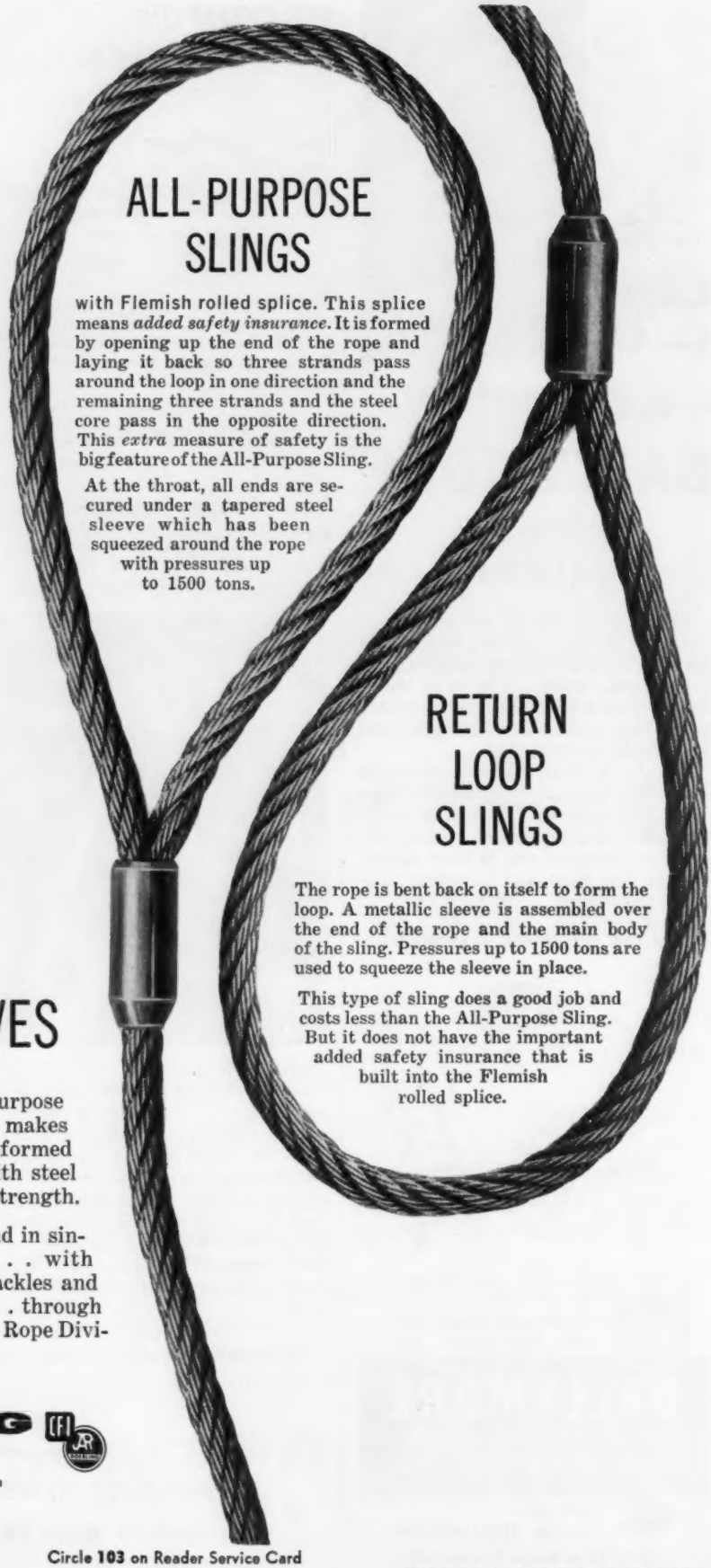
For brochure on entire line Circle # 140
For brochure on Roll Clamps Circle # 36

LITTLE GIANT®

LIFT TRUCK ATTACHMENTS

LITTLE GIANT PRODUCTS, INC.
1530-50 N.E. Adams St., Peoria, Ill.
Established 1918

Circle 66 on Reader Service Card



ALL-PURPOSE SLINGS

with Flemish rolled splice. This splice means *added safety insurance.* It is formed by opening up the end of the rope and laying it back so three strands pass around the loop in one direction and the remaining three strands and the steel core pass in the opposite direction. This *extra* measure of safety is the big feature of the All-Purpose Sling.

At the throat, all ends are secured under a tapered steel sleeve which has been squeezed around the rope with pressures up to 1500 tons.

RETURN LOOP SLINGS

The rope is bent back on itself to form the loop. A metallic sleeve is assembled over the end of the rope and the main body of the sling. Pressures up to 1500 tons are used to squeeze the sleeve in place.

This type of sling does a good job and costs less than the All-Purpose Sling. But it does not have the important added safety insurance that is built into the Flemish rolled splice.

SOMETHING different UP THEIR SLEEVES

Take your pick of either the All-Purpose or Return Loop Sling — Roebling makes both. And both are made from Preformed "Blue Center" Steel Wire Rope with steel core. Both develop full catalog rope strength.

They are available as chokers and in single and multi-leg construction . . . with thimbles, half thimbles, hooks, shackles and swaged open and closed sockets . . . through your distributor or Roebling's Wire Rope Division, Trenton 2, New Jersey.

ROEBLING

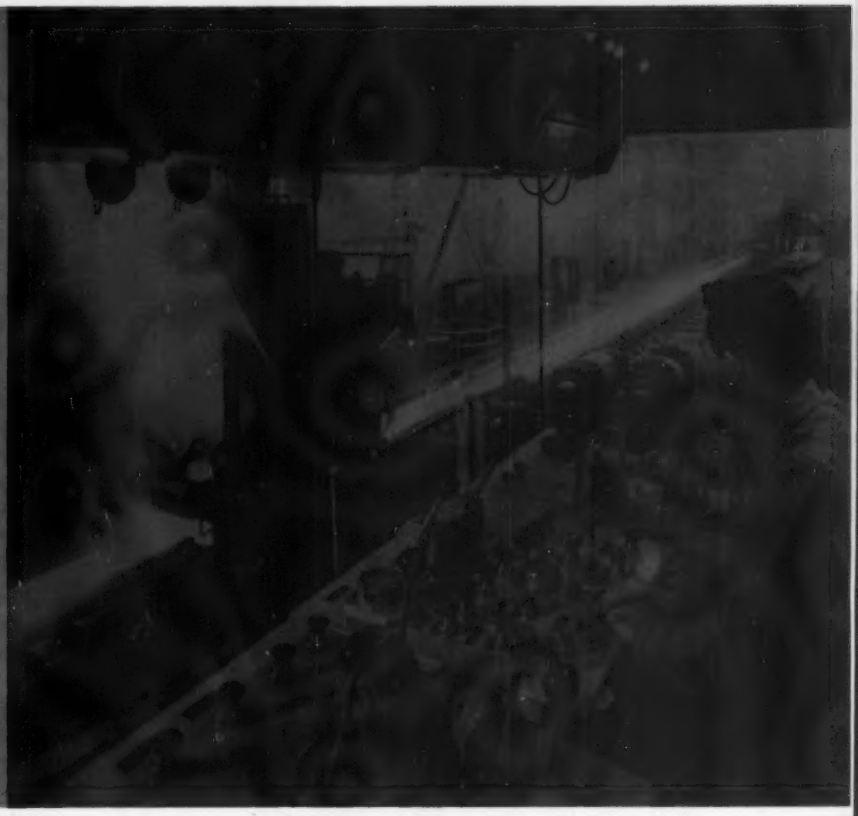
Branch Offices in Principal Cities
John A. Roebling's Sons Division
The Colorado Fuel and Iron Corporation

Circle **103** on Reader Service Card

Material Handling Engineering

AUGUST 1961

Computers and controls make systems



Dare you use them? dare you ignore them?

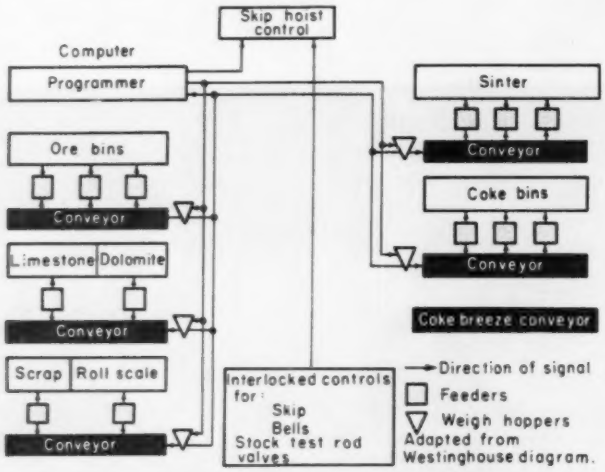
SOONER THAN YOU EXPECT you will have to determine the *maximum* use of computers and controls in your material handling.

Time is running out fast because computer and control equipment is getting better and better at doing the chief jobs of material handling—*remembering* (where materials are, where they go), *figuring* (how much is needed, when, where, how to get it there), *measuring* (quantity, quality), *deciding* (inspecting, sorting), and *commanding and executing commands* (routing, dispatching, transporting, shipping). Computers do the routine parts of these jobs faster, more accurately, more tirelessly than people. Give a computer the right set of instruments and actuators—that is, controls,—and it will perform almost as if it had eyes, ears, fingers and muscles.

Examples. Here are some ideas of what this new equipment can do. Material handling is the heart of blast furnace operation, involving storage, conveyors, hoists, complex scheduling of material mix and movement. The diagram and description on the next page show how computers and controls govern this MH activity.

You say, "That's process—it isn't like my operation. My trouble is in the warehouse." Good. Here's some-

COMPUTER CONTROLS BLAST FURNACE



COMPUTER controls conveyors, skip hoist, valves, bells to feed blast furnace.

OPERATING a blast furnace is largely material handling, and complex. You put in tons of ore, sinter, coke, limestone, dolomite, water, air, probably some scrap or roll scale. How much of each depends mainly on the kind of pig you want, chemical analysis of input materials, temperatures, and pressures in the furnace.

From storage in stockhouse bins the materials move on belt conveyors to weigh hoppers, then in skip hoists to the top of the furnace. Sometimes reactions in the furnace go fast, and there is room for the next skip of material. Sometimes reduction is slower, and you can choke the furnace by overfeeding. The material can stick in the bins, hoppers, or skip, fooling you about the amount charged. That's why it's complex.

To run a blast furnace the conventional way you have to be able to figure fast, and also to arrive at sound decisions based on judgment when you can't do the arithmetic fast enough to keep up with the process.

Computers and controls go a long way toward taking over the whole job of figuring. The computer receives data from instruments which tell how the furnace is operating, digests all the figures, and controls input. It can actually operate conveyors, hoist, etc., scheduling flow of materials in the right proportions to get pig of the desired quality. The information from instruments is processed so rapidly that commands are always according to the current situation.

The computer is also building up a store of data about furnace operation, more complete than any previously available. This will help increase output and make the product better in the future. Use of the computer has already increased output, per furnace and per crewman, well beyond previous capacity.

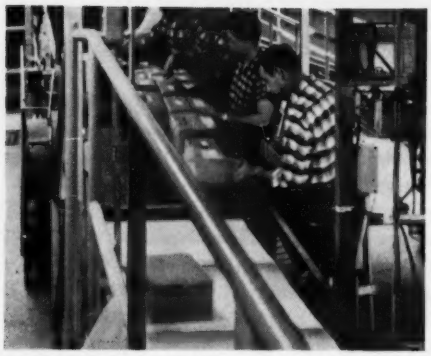
thing that can happen at 4 p.m. today in a warehouse: At that hour a telephone installer in Dayton, Ohio will get a telephone subscriber's instructions for installing four telephones, in different colors, each with special features. He won't write this order. He will simply sort out punched cards from a pack he carries, feed them into a device attached to a telephone, and instantly a computer at the warehouse in Solon, Ohio, 205 miles away, will write an order to the warehouse, adjust inventory records, and do all the other order-processing jobs. Instructions will go to the warehouse at once, the material will ship tonight, and tomorrow morning the installer in Dayton will have what he needs.

Kinds of industry. Every industry is different, but most fall into one of three classifications: Process (like chemicals, oil refining); mass production (like building appliances, autos), and job and batch work (like constructing capital goods equipment). The blast furnace example shows how computers and controls fit into a process. As mass production becomes more automatic it resembles process industry more and more. (See "A New Dimension in Computer Control" page 50). The individual automatic machines hungrily demand a continous flow of materials or parts or sub-assemblies. Computers work fast to coordinate flow and machine operation, preventing gluts and shortages, policing movement from stock to manufacture and assembly, from assembly to shipping and storage.

Job shops. They are really different. You have to schedule every job individually. Often you have many choices of machines, each differing a little in capacity, costs, etc. Ideally you keep every machine working at the job it does best. Practically you must cope with the complexities of meeting due dates, handling rush orders, gaining time on behind-schedule work. You can smother under stacks of Gantt charts and routing cards if you aren't careful. You can also waste capacity or run up costs by wrong choice of equipment—putting the big job on the little machine and the little job on the big machine. Computers help you out of this mess. *Example:* an aircraft manufacturer kept 8 clerks and a platoon of expediters hopping, just following inquiries on the status of various jobs; they handled 750 to 1,000 inquiries each 8 hour shift. After putting in a computer to schedule and follow the jobs they were able to reassign the 8 clerks and 12 expediters.

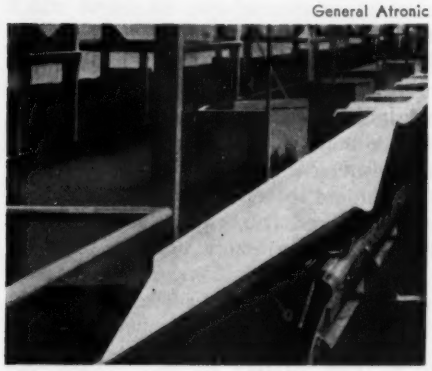
How do computers do these jobs? They follow the same processes of record keeping and calculating that logical people follow in routine decision making

Tell you how much is in stock
Tell how much is in process
Give you routine schedules
Tell you the best sequence of operations
Tell you which combination of machines to use to do each of several jobs going through at the same time
Keep track of information from your control instruments (data logging)
Take products over a route set by information on an order (controls alone may do this)
Make up bills of materials, and help you use the best order of steps in assembly
Formulate—tell you how much of each of several variable raw materials to mix into your batch, to



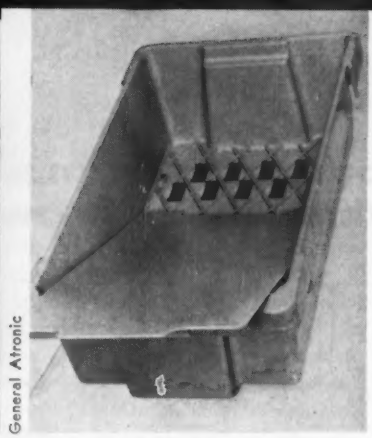
BY PUSHING BUTTONS operators direct parcels to any one of 40 destinations. Installation handles 9,000 parcels an hour.

General Atronic



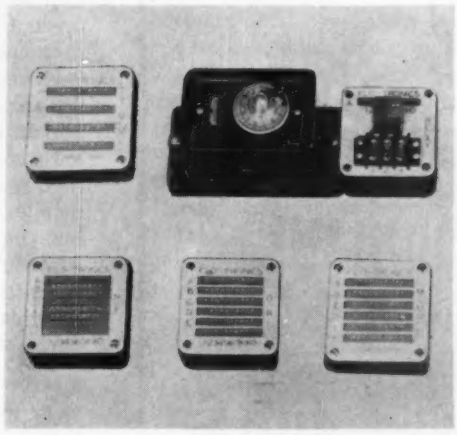
CONTROLS on the parcel sorter remember the destination for each parcel, tilt the tray at the right place.

MAGNETIC code can also put memory on package, or on tote box.



General Atronic

TO HOLD MESSAGE this plastic tote box has metal inserts.



Flo-Tronics

LOGIC MODULES remember information put into material handling system by gages, push buttons, and take require action.

get uniform output, or minimize cost
Tell you how much you have produced
Dispatch equipment (e.g. automatic elevators)
Record and analyze your shipping data (how much, to whom, where, when)
Simulate a problem you have or expect to have, figure out the effect of the various changes you might make to solve it
Tell you the best material handling routes in your plant
Tell you the best shipping routes, using common carriers or your own vehicles

Applied math. For some of these tasks you must use the computing equipment every day—for example, in keeping track of inventory. The computer is used because it cuts the cost of a routine job. Other projects, like determining the best material handling routes, depend on solving a mathematical problem once, when the problem cannot be done manually because it takes too long—months perhaps. The computer's speed allows you to employ many such mathematical techniques, among them—

Determining economic order quantities
Applying queuing theory
Use of linear programming
Developing travel chart information
Determining critical paths for assembly
Applying games theory

Everyday uses of computers usually govern decisions—send a purchase order—increase a conveyor speed—use more lime and less soda—etc. Put in controls and the computer can take the action which the decision indicates. Controls literally resemble human senses—they see, feel, hear, even smell; they can also be the computer's biceps and fingers. There is a reason for lumping together the sensing and doing functions of controls. Their use usually involves employment of feedbacks and servomechanisms. The control detects a condition, makes an adjustment in a mechanical device, then measures the result of the adjustment and makes further corrections.

Some control uses. More often than not automatic controls work without computers, or with very simple memory systems. They measure quantities and qualities, detect flaws, read codes, maintain uniformity of speeds, temperatures, etc. Used in sets these can become complex. For example, with controls you can open the door to a bank when a customer approaches, but keep the door closed if you have a long queue inside, lock the door if the burglar alarm is set off, open it and keep it open if the fire alarm sounds. The use of such a set of controls for material handling is described in the paragraphs on Keebler Baking's system on page 48.

Keebler's system is interlocked, complex, sophisticated, but still primarily made of controls. They are blood-brothers to a brood of weighing scales, load cells, photoelectric eyes, thermocouples, thermometers, thermostats, mechanical feelers, proximity switches, limit switches, ultrasonic gages, X-ray gages, and me-

MODULAR CONTROLS GOVERN FLOUR FLOW

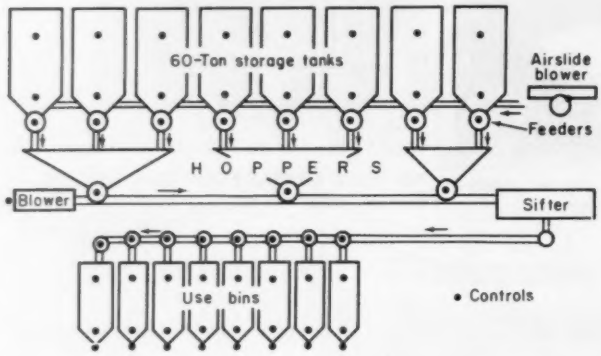
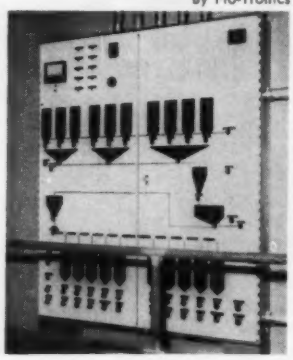


DIAGRAM shows essential parts of system for handling flour. Dots mark some of the controls.

Adapted from drawing By Flo-Tronics



CONTROL PANEL at Keebler matches diagram above.

CONTROLS govern handling of flour in bulk in the receiving and storage system of Keebler Baking Company, Philadelphia.

Keebler receives flour from the mill by special highway trailer or Airslide railcar. Pneumatic conveyors carry the flour to storage tanks, as the diagram shows.

The bakery uses 3 grades of flour, needs accurate control of the varying amounts of each grade in stock, controls tell which storage tank has room for incoming flour, which to tap when the material must be moved from storage to "use" bins which feeds mixers and blenders in the bakery.

These controls are simple, but as a system they are sophisticated. The simplicity is achieved by using solid state components—transistors and junction diodes—where you would expect moving contacts, relays, sequence and timing switches. These components are made up into modules—standardized, packaged arrangements of several transistors with standard wiring. This makes it easy to hook up the system. This system is one in which the logic modules, (control elements) remember, report, and decide, instead of having a computer to do it. They report whether bins are empty or full, thus produce the signal output which controls the flow of flour into the storage tanks, and from the tanks through a sifter into the use bins.

Sophisticated design of the system enables the operator to find out in a quarter second how much flour is in any bin. This compares with 2½ minutes which conventional systems take. It also gives pushbutton dispatching of flour from any of the 10 storage tanks to any of 10 use bins. The information is shown on the panel pictured above. This makes it easy to comprehend at a glance how the system is performing.

chanical trips, and signalling tabs. They can do part of the computer's job if you give them a memory and scanner (unit which compares information coming from several sensers).

Control systems that do some remembering, some deciding, are now often used in material handling systems. Example: a counter counts items going into a package, trips a switch and starts a new package after tallying a given number. More sophisticated: Packages on a conveyor pass a girl operator engaged in sorting into groups. As each passes she punches a button designating the group the package should go to. This puts a magnetic signal on a rotating disc (memory)—the disc turns at a speed analogous to the speed of the conveyor. As soon as the conveyor carries the package to a diverter corresponding to the proper group, the memory disc has turned a proportionate amount, so the magnetic signal reaches a detector head which opens the diverter, sending the package to its proper designation. (See photos on page 47.)

Controls sort goods better than people can. Controls also count, position or index, route, identify, formulate materials in a batch, and inspect.

Examples are impressive because they usually show that controls are more precise and sensitive than people. Ceramic tiles fired at one time differ in color, but shipments must be extremely uniform in color. Electric eyes detect the differences in tint, and sort according to color gradations more accurately and indefatigably than human hands controlled by eyes.

Item memory. The product or its package can incorporate its own memory, doing away with devices like the disc just described. This works if you have a controlled input of packages—tote boxes or cartons originating in your plant. The man who starts the tote box can route it by setting tabs, putting a magnetic code on the container, or putting on a visible code which can be sponged off or stripped off later. Sometimes the distinctive trademark or label on a case can be made the routing code—electric eyes read it. A combination might be a fine idea—say you manufacture seven kinds of canned soup, all of which go through the same packaging and pasteurization line. Mark your cans magnetically before they reach the fillers and pasteurizers, read the code to be sure you put the right label on, then use a visual mark on the carton to sort for shipping or storage.

New developments. Though computers and controls have developed fast, their evolution is hardly slowing down. For a decade the excitement has been about digital computers, the ones that add and subtract numbers, $1 + 1 = 2$, etc. They are spectacular, versatile. This din may have concealed the importance of analog computers, the kind that represent quantities by proportionate amounts of solid material, liquid, electric current, etc. Analog computers can be cheap, simple, compact—examples are speedometers, slide rules. They compress into small space memory of unlimited range of values for a mathematical function.

Digital computer experts are taking a new look at analog devices, and many are moving in the direction of hybrid computers—partly digital, partly analog. This development may cut computer cost, increase operating speed, and extend memory capacity. The

hybrids are likely to be adaptable to material handling needs because problems of scheduling, flow control, etc. don't require answers precise to the last digit.

Computer changes. In terms of hardware, computers are changing rapidly. Optical readers challenge the place of punched cards, punched tapes, and magnetic ink markings. They eliminate errors due to keypunch operation. Magnetic cards also threaten the position of punched cards for some records. You can erase and rewrite a magnetic card when the data change, while punched cards have to be made over.

More compact computers will be feasible if cryosars, new transistors which operate at temperatures near absolute zero, can be employed. These work with very small electrical currents, and are so tiny you can pack hundreds into the space an ordinary transistor takes. Space saving is important because as it is achieved, computers can come closer to "brainpower."

Exciting changes are also taking place in the design of instruments and controls. Modular solid state (transistor) electronic units defy wear, simplify wiring. Possibly the most promising wholly new control employs an X-ray sensitive Vidicon tube for non-destructive testing—you get a TV picture as readable as film, with the speed and cost of fluoroscopy.

Do computers think? But the big development computer men discuss is computer "brainpower" and the "thinking machine." They describe present day computers as idiots, no more capable of thinking than a set of log tables. Understanding of this fact dispels much of the awe with which even engineers have approached the "electronic brains." It is true, however, that computers already make decisions of the kind that occupy much of the attention of middle level and even top management. Computers do this if the logic of the choice can be reduced to a mathematical formula which can be used repeatedly.

Making computer decisions. The key to the action you take therefore lies in the degree to which you can apply formulas to decisions in your operation. For small decisions (which tile has the right color?) controls suffice; for big ones (which combination of machines to use), and little decisions in big volume (economic order quantity) computers help.

You can't know how formulas fit your work unless you know a good deal about computers and controls. Your management is likely to be under competitive pressure, and under pressure from your accounting department, engineering, sales, and others to install computing facilities. They will ask you to evaluate the use of advanced equipment in material handling. Can you give a good answer?

Is this a big assignment? Moderately. You aren't expected to be a computer and control expert. You need general information about equipment on the market, just as you should know something about an automobile before you buy one. Take for example the distinction between digital and analog computers. Analog computers fit some of your needs, but they won't help you much with order-picking and inventory control. You need to know this. The kind of information you need isn't hard to come by. You will find more and more of it in periodicals, like MHE. There are many readable books you can get—some are listed at the end of this article.

Get started now. You may wish to take the initiative in getting your company headed toward computer use—this is very likely if you are in warehousing. If so, there are some guideposts to follow. Makers of computer and control equipment will help you get an installation which pays — they want you to gain from using their products. But you have to define the job which the computer will perform, decide for yourself what you want. It follows that what you get will pay *more* if your company develops understanding of computers before accepting a recommended system. You will have to train or hire an expert for the equipment you install. Get him first, the equipment second. Or, shorten the process by using external experts—there are good consultants available to help you.

Moreover, don't expect a perfect, permanent solution. By the time you get your installation in more advanced models will be announced. Then you can take the advice Dr. John Mauchly gives all who have computers now: "Before you consider a new set up, be sure you're making the best use of what you have. Users rarely get the most from computers they are operating." Mauchly should know—with a partner he built the first electronic digital computer in the world. ♦

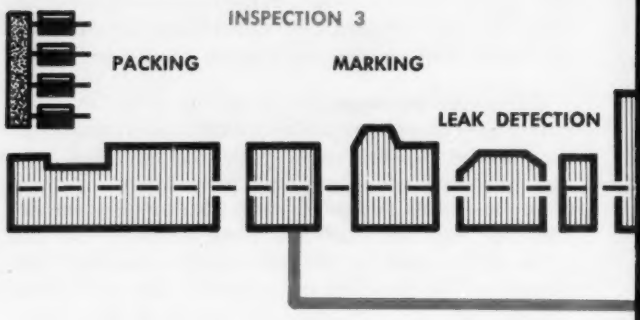
Acknowledgment: The editors wish to acknowledge the help of many companies and experts, especially: Dr. Melvin Salveson, Alwac Computer Div., El-Tronics Inc.; James A. Commins, Atronic Products, Div. of General Atronics; Herbert Weyrauch, Flo-Tronics, Inc.; General Electric Co.; J. Y. Huber, Keebler Baking Co.; Burt Benson, Maico Electronics, Inc.; Dr. John Mauchly and Martin Paskman, Mauchly Associates; Dr. E. L. Harder and John Kostalos, Jr., Westinghouse Electric Corp.

FOR FURTHER READING:

COMPUTERS AND PEOPLE—*John A. Postley, McGraw-Hill, 1960*
CYBERNETICS—*Norbert Wiener, John Wiley,* 1948.
INSTALLING ELECTRONIC DATA PROCESSING SYSTEMS—*Richard G. Canning, John Wiley, 1957.*
ELECTRONIC COMPUTERS—*T. E. Ivall, Philosophical Library, 1960.*
WHAT YOU SHOULD KNOW ABOUT COMPUTERS—*W. Paul Gilpin, Modern Office Procedures, March, 1961,* pp. 16-20.

DR. E. L. HARDER and Engineer John Kostalos (left) explain Westinghouse computer programming module to MHE editor, John Spencer, author of this article. They are showing how encapsulated transistors and resistors mounted on printed-circuit base make the "building block."

FEEDBACK control and correction of the helixing machine are based on automatic inspection station No. 2. Development Engineer Marion Clark points to a reading on the graph which corresponds to the rejected resistor in his right hand. Notice the conveyor with a pallet for each resistor.



Total line management by computer

By DICK DIETZ, *associate editor*

A TRULY SELF-SUFFICIENT LINE—virtually unmanned—turns out a deposited carbon resistor every three seconds. But not just any old resistor. I'm talking about a product so reliable its failure rate may not exceed 1 per 200 million operating hours.

This 110-ft.-long line at Western Electric Company's North Carolina Works, Winston-Salem, is spectacular. All they need is three or four workers to remove completed resistors, to keep vibrating feeders filled, and an occasional technician to read graphs.

The boss of this line: a general computer, digital with 4,096-word magnetic memory drum. It controls programming, machine setup, and line feedback. Basically, the computer:

Programs production control, receives a month's production requirements—fed at random—and then schedules the work.

Analyzes data from three line inspection stations, applies statistical tests to see if a trend is developing.

Detects a drift away from acceptable tolerances. When a drift occurs, the computer uses stored data to correct the erring machine.

Provides initial wattage setup for eight machines, resistance values at six machines.

Magnificent show. I watched this manufacturing line in action, the computer, computer controls, conveyor controls, 11 machine stations (including three inspection stations), plus an isolated cap-lead welder (more about this later).

Deposited carbon resistors are used by the millions in missile systems, by the dozens in radio, TV sets, and other electronic products. Military requirements (Nike-Zeus system) triggered the birth of this formidable line—requirements of fabulous reliability, high output, low cost. Traditional manual and semiautomatic methods merely approach its capabilities.

The resistors come in four power sizes: ¼, ½, 1, and 2 watts. Each power size may get a myriad of resistance values. It's possible to turn out 1,200 resistors an hour, all within ±½ percent of specified value.

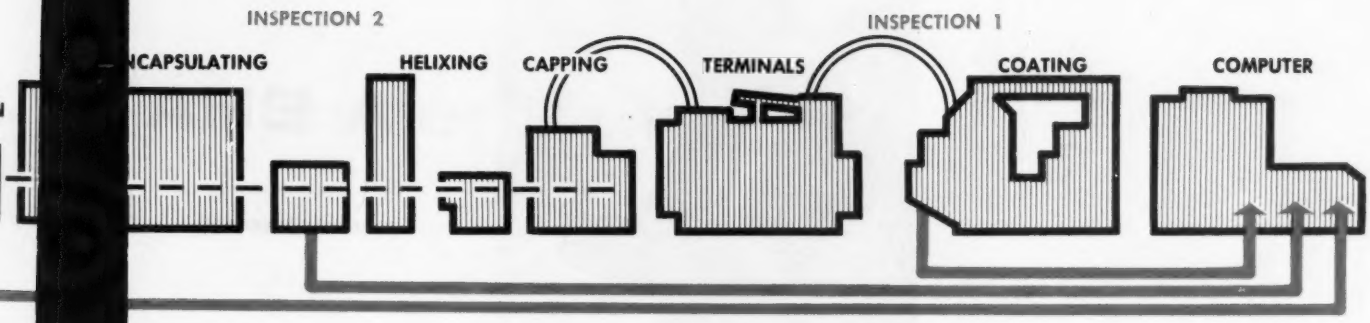
System efficiency. Efficiency of the entire line is 65 percent presently. Western Electric is shooting for 85 percent. How the resistors are used determines the efficiency of the line. That is, military standards, much more demanding than ordinary electronics standards, keep the efficiency lower because the resistors must be of highest quality with little room for variation.

A vital point for a workable system: There's conveyor space between each machine to accumulate five minutes' worth of stock. Each machine feeds from this inprocess storage on demand. When the storage space fills, this stops the previous machine, guards against pileup.

Material transfer. Western Electric engineers worked out more than 200 transport difficulties to make the line work. Plastic tubes connect the first four machines. Air pressure blows resistor cores along.

From the capping machine on, each resistor moves on its own stainless steel pallet. V-belts drag the pallets from beneath. At some stations, rubber tipped push rods lift the resistors right off the pallets through a hole in the pallets. The push rods hold the resistors by vacuum exerted through the rod's hollow core.

The line at work. Join me in a brief tour of the line. But first, a word about the computer. Western



Electric engineers modified its input and output equipment. In the main, the computer is time shared. There's no delay, however, thanks to the computer speed of 140,000 bits a second.

Coating. A vibrating feeder delivers a small ceramic core to a tube that leads into a 3-chamber furnace. Inside, temperatures of more than 2,000° F. decompose methane gas. This releases crystalline carbon which uniformly coats the core.

Feedback to the computer reports the speed of the core through coating, the temperature, and the flow of methane gas, compares them to statistical quality control data stored on the memory drum. Control actually occurs at the first inspection station, where the cores arrive from coating after they've cooled. Four probes, using the Kelvin bridge principle, send back the information to the computer. This station features a graph for immediate monitoring. At inspection, the computer also arranges for magnetic slugs to fall into place between varying lots of resistors.

Terminals. The cores, reloaded automatically in a pneumatic tube, travel end-to-end to a terminating machine with 36 rotating index vacuum chambers. Each core gets a mask, a flat cylinder with a hole into which the core fits. This exposes only the core ends, keeps the carbon coating in the middle untouched by this process. The computer programs the proper mask size.

The core, placed in a vacuum station, is covered with a bell jar. Out pumps the air, replaced with argon gas. Particles from a gold cathode sputter a layer one-ten-millionths-inch thick onto the core ends in about a minute.

Capping. Here subassemblies made by the cap-lead welder, a machine isolated from the line, combines with the cores. The cap-lead welder percussion welds a solder-coated lead wire to a gold-flashed brass cap, 3,600 an hour.

The cores load into a turret from a pneumatic tube. Capping chucks force the cap-lead subassemblies, fed from a vibrating bowl, over both ends. This cold welds the caps to the gold on the core ends. The computer makes the right choice of two capping assembly heads, three different sizes of cap. What is now a primitive resistor moves on by conveyor, each to its own indexing pallet.

Helixing. The resistor, removed from its pallet and held by a chuck, spirals against a diamond-impregnated wheel. This cuts a groove in the carbon, gives the resistor a precise value. A computer-controlled bridge monitors the cutting, disengages the cutter when the proper resistance is reached. This bridge also automatically senses faults, dumps rejects into a small metal box alongside the conveyor.

The control bridge is biased slightly to compensate for machine inertia and resistance changed by heat of the grinding. This information is stored on the computer memory drum. Spiralling takes only three seconds, a fraction of what it takes by hand.

Encapsulating. A cured epoxy shell goes over the core, rests on the gold caps, leaving an air space along the resistor body to keep the carbon deposit uncontaminated. At each end goes a partially-cured epoxy pellet. After 15 minutes in a 300° F. oven, the pellets soften, sealing the resistor. It's then cooled in water jets. Detection circuits reject imperfect resistors.

Leak detection. A holding clip immerses each resistor in a hot water bath with a wetting agent to halt resistor surface bubbles. Heat expands air inside the capsule. Ten photoelectric cells watch for air bubbles, can spot leaks as small as 0.000002 cc. A memory unit rejects improperly sealed resistors.

Marking. Printed on each resistor are its wattage, resistance value, production lot number, and date. The printing is offset, but unusual. The typehead is stationary, while the blanket roll and inking rolls turn. A stationary typehead is necessary to permit automatic type changing. This is controlled by the computer which, using servo drives, can set more than 1,500,000 code and resistance value combinations.

The final inspection station, through feedback, resets inspection station no. 2 to compensate for changes in resistance value caused by the heat of encapsulation. The second inspection station controls the resistance value through helixing.

Packing. Each resistor lines up between loading jaws on a platform. When the platform fills, an anvil pushes the resistor leads on one side into a styrofoam block. The blocks then load into a magazine. The computer controls the anvil strokes for each of the four resistor sizes. A worker then places the magazines into a rack. ♦

A BHA*

By HARRY FREEMAN

Material handling elder statesman Harry Freeman leans back in his desk chair, takes a broad look at his chosen field. He sees it with esteem for its opportunities, compassion for its difficulties, sorrow for what it might be but isn't. In Freeman's eyes handling has not achieved the status of many other industrial jobs. Freeman is an educator, has been an equipment distributor, consultant, industrial engineer, historian, inventor, teacher, photographer, and philosopher. He reflects, frequently comes up with unusual ideas. They're nearly always workable, thoroughly believable, and fascinating. Take his views on status ("Better Status—A New Plan," MATERIAL HANDLING ENGINEERING, October, 1960). He proposed to upgrade the handling field—through a strong association with strict requirements for joining. Now he presents an approach to better status through education. In his usual thorough way, Freeman lays the groundwork, then proposes a specific program, made up of courses which you can find in many college catalogs. Let Freeman tell the story.

ONE COLLEGE in the United States, Northeastern University, has a curriculum leading to a degree in material handling engineering. This reflects less credit on Northeastern than discredit on the rest. Don't get me wrong. I don't belittle Northeastern for pioneering. Nor do I really blame the others. But the best they do with material handling is night courses and occasional seminars.

These are useful, but they don't fill the gap only a full 4-year course can fill. Of course, you don't set up 4-year courses unless you have prospective students. And prospective students want to know: Is there a material handling job for me when I get out of college? I tell them yes, a ready job.

Then why can't you get a degree in material handling? Are colleges against them? Not so far as I know. Officials at two institutions told me they like the idea but feel it needs further study. They wanted to know what we in the field want.

The college attitude is not a basic difficulty. Colleges adjust readily when shown needs. Have we failed to show the need for a degree in material handling?

Defining our man. The industrial engineer often becomes the material handling man in a plant. But the industrial engineer's scope is limited to time and motion study, mechanical operations for processing, quality control. His field primarily is processing.

Our man must deal with more than handling in production. He must deal with handling in receiving, shipping, warehousing, storing, packaging, to name a few. Material handling is so vast it may represent 60 percent or more of most industries. A foundry, for example, is nearly all handling—over 90 percent. The only processing is melting and pouring.

Does industry agree? It must, if for one reason alone. Only the trained material handling man can truly determine the manpower hours that help fix product costs. He can—and must—know manpower hours even before processing starts.

What to do. Therefore, let's have handling men trained as handlers with degrees in material handling.

**Bachelor of material handling arts degree*

for better status

I propose a curriculum, leading to a bachelor of material handling arts (BHA) degree. Arts? What's wrong with a bachelor of science? Because handling includes the art of business administration, requires spot decisions and many practices far removed from scientific applications.

The undergraduate degree is only a step. Let our student achieve further degrees by pursuing handling specialties. It is here, through specialization, that a scientific approach can be made to material handling. Graduate work offers master's and doctor's degrees in science.

To achieve a BHA degree, I propose that the student take five required major subjects a year – with an emphasis on the humanities. Then I propose that he also take five electives a year, presented by teachers with material handling experience. Notice that I haven't put in too much engineering at first. I'm more interested in developing a well-rounded man.

Major Subject Requirements

First Year	**Economic History**
	Statistics
	Introduction to Literature
	Math—Trigonometry, Algebra
	Marketing
Second Year	**Modern World Problems**
	Math—Analytical Geometry
	Organization, Management of Production
Third Year	**Ideas, Institutions of Western Society**
	Drawing (Engineering I)
	Physics—Mechanics, Electricity
Fourth Year	**Government and Business Activities**
	Economics of Management
	Physical Distribution
	Layout, Planning, Operation
	Product Logistics, Handling Practices

There's room for other major subjects, such as English, chemistry, more math, foreign languages, other engineering courses. I don't propose a hard and fast course. I expect some of you will dispute my ideas. But I hope we can eventually develop a sound plan.

The electives. *At least five each year.*

1–Space charting, planning, area costs.
2–Layouts, structural details, floor plans.
3–Handling bulk, liquid, package materials.
4–Selecting handling equipment, sources.
5–Powered mobile equipment, pallets, skids.
6–Conveyors.
7–Receiving.
8–Production line handling.
9–Storage, warehousing.
10–Packaging, packing, shipping.
11–Air, motor, rail, water freight.
12–Operation procedures and records.
13–Management reports, charts, statistics.
14–Automation, problems and effects.
15–Controls and computers.
16–Business fact gathering, sources, government information.
17–Labor relations.

A plan to get started. I present the courses only for discussion. I'd like to see some group take over, like education committees of AMHS (American Material Handling Society). They could hold discussions with educators, engineers, and spokesmen from industry in their communities. Then they should prepare a curriculum leading to a degree.

Even if started tomorrow—everything working as smoothly as possible—it would take five years before we'd turn out the first handling engineer. Figure a year for planning and four years for the course.

The challenge: providing a broad cultural education, stimulating the student's desire to succeed. We must make him flexible and then teach him specialties. He must realize that he's entering a new field, competing with men of great experience already contributing to the art of material handling. ♦

About specific courses

Until some plan, such as Freeman's, is adopted, we'll continue to depend on single courses, extension courses, and seminars.

The College-Industry Committee on Material Handling Education has put out a 166-page outline in a loose-leaf binder. It's a basic guide for presenting courses in handling or industrial packaging. (See News Roundup, MATERIAL HANDLING ENGINEERING, July, 1961).

MATERIAL HANDLING ENGINEERING lists many courses presented by various colleges and organizations. Write us and we'll help you.

PROJECT Upgrade

How to get yourself an AAA-1 rating when financial management applies its tests to material flow management. The 6th article in a series to help you further your career.

Material control and the balance sheet

By **E. RALPH SIMS, JR.**, *Consulting Management Engineer*

IT IS NOT HOW MUCH PROFIT you make on each transaction but how frequently you make a profitable transaction that counts in business.

This is well demonstrated by the difference between supermarket markups and department store markups. Supermarkets move a high volume at low markup, and they profit. This is profitable because the material control and flow are well-conceived and because grocery distribution is modern and efficient.

Most department stores are governed by merchandising traditions and practices antagonistic to efficient material flow. To pay for services to customers and other activities markups must average 35 to 40 percent. The ratio of transaction rate to capital and inventory investment is considerably lower in department stores than in supermarkets.

Keep money moving. This relation of material control, material control, material flow, and cash flow is important in business management. If materials speed into, through, and out of a business system with high frequency and efficiency, you can pick up a small profit on each transaction and keep the money moving. This enables management to work with less capital investment and to get a higher return.

For example, if a manufacturer's warehouse turns its stock 20 times a year at a gross profit of 10 percent, an inventory of $1 million produces an annual gross profit of $2 millions. But if you rotate this same $1 million inventory three times a year with 20 percent markup, the gross profit is only $600,000 a year.

This example emphasizes why you should try to—

Keep things moving
Keep inventory down
Keep dollar lockup at a minimum

Rapid material flow benefits consumers as well as the producer. The producer gets higher gross profit, needs less capital to run his business. The consumer gains because management can save money and sell cheaper.

Interpret the sheet. The balance sheet tells you when material flow is rapid, because you can calculate turnover from the balance sheet figures for net sales and inventory. Inventory is a word with many meanings:

—to a sales manager it is stock available to sell
—to a warehouseman it is the merchandise in his warehouse
—to a production control manager it is material available to meet his schedules
—to a procedures man it is the documentation that controls physical inventory

All these people are right, but the most important meaning of *inventory* is the accountant's. He sees it as dollars. As a financial manager he considers inventory a dollar limit. Thus he generalizes in terms of dollars, ignoring the composition of inventory, its product mix and the depth and length of line which are so important to the sales organization, the production control group, and the warehouseman. These people need to know inventory in terms of item quantities, because mix, depth, and length affect their performance.

How inventory affects. A long line with great depth of inventory gives the sales manager confidence that he can deliver anything he sells. A long line with little depth of inventory gives the warehouseman order-picking problems. A short line with great depth gives him the ideal storage operation. An inventory

EXIDE POWER PACKAGE

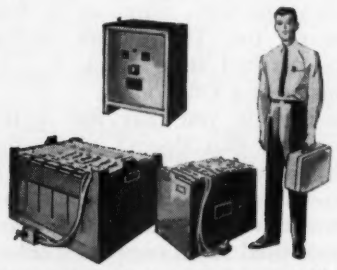
Exide Industrial Marketing Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

Extra economy assurance for your new walkie-type truck—the Exide guarantee of battery life equal to truck life.

BATTERY GUARANTEED FOR LIFE OF TRUCK

Let's say you're about to buy a new walkie-type electric industrial truck. You want long battery life for maximum economy, and you don't want the nuisance of ever replacing the battery, if you can avoid it. Well, this is the Exide offer:

For walkie-type low lift trucks and hand tractors, the recommended Exide nickel-iron-alkaline battery (the type invented by Thomas A. Edison) is guaranteed for the life of the truck—provided the truck remains in your possession and approved maintenance procedures are followed.



The Exide Power Package. Recommended battery and charger from the world's broadest lines—plus factory-quality service to cover both.

This is not a reckless offer. Exide knows from countless actual performance records that these batteries readily give this kind of life. Many Exide nickel-iron-alkaline batteries have been used in walkie-truck service for upwards of 20 years and are still going strong. So the plain fact is that we are simply giving you positive assurance of battery value that is already there anyway.

Long life is one of the characteristics of Exide nickel-iron-alkaline batteries. They have other unique advantages too. They are lighter in weight than other batteries. They give off no corrosive fumes during use or while charging. And they can be stored indefinitely without injury. This is of special value during seasonal shutdowns or other inactive periods. All you do is discharge the battery, short-circuit the terminals and store in a clean, dry place.

Of course, for any type electric industrial truck—walkie, rider, or narrow-aisle—the maximum power economy depends on three factors: the right battery for the job, a charger to match, and needed service. This combination is the Exide Power Package.

Circle **40** on Reader Service Card

Your Exide representative studies your requirements, then recommends the battery best for your needs from the broad Exide line. He is completely objective in determining your needs because Exide offers all types: Exide-Ironclad with tubular positive plates, Exide-Powerclad premium flat-plate, and Exide nickel-iron-alkaline. Exide chargers are available in both motor-generator and silicon rectifier types and in sizes to cover all needs. Exide service men are coast to coast, all factory trained on batteries and chargers.

The Exide Power Package is your easiest way to get not only maximum battery life in your applications, but maximum battery economy year after year. Write for details. Exide Industrial Marketing Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

Exide®

between these extremes offers some problems, some advantages. For the production control man inventory is a matter of space, flow, and dollar management. To the financial planner inventory represents cash unavailable for other uses.

Project Upgrade articles have emphasized that control and good material handling management go together. Financial management is a form of control, and its main gages, the balance sheet and the profit and loss (operating) statement, are strongly affected by inventory levels. In many states you pay taxes on inventory. It always increases overhead. You usually have insurance expense for inventory, and inventory always absorbs dollars so you cannot use them for other things.

Sometimes accountants can manipulate the balance sheet and profit and loss statement so high inventory has advantages. Usually, however, financial analysts recognize that the relations of inventory, turnover, cash availability, and sales volume are distorted if the inventory has been increased to raise the apparent net worth of the business. It does little good to build inventory and declare it at market price to increase net worth. If the products in inventory do not have a ready market, inventory merely locks up your cash. If this cash were available in liquid form it would increase the company's ability to meet unexpected situations, and to earn.

Budgeting labor cost. The relations between labor cost and material flow also show up in the budgeting phase of accounting. If you base a budget on standard or average costs, your budget figures include estimates of material handling costs and the cost of owning raw materials and finished goods. The material handling manager must meet the budget whenever possible. Material handling is difficult to budget because it is difficult to standardize. Work sampling is one way to set valid budget standards. Though these are not generally acceptable for setting up wage incentives, they are adequate for budgeting and for scheduling manpower. You can then use average costs to compare your work sampling standard with actual performance and budget. You can also audit the budget periodically by direct time study or work sampling. These techniques are essential for getting the data you need for projecting costs of new material handling methods or for estimating results from changes in management concept.

Understand the accountant. As material handling engineers and managers we must understand the accountant's point of view if we are to make good use of the information he provides.

In general (and some accountants will take exception to this) accountants act as historians and tax experts. In most organizations industrial engineers, plant managers, and controllers have difficulty in extracting the information they want from accounting data. Operating people are interested in units—hours, pound, feet, etc. They are not interested in the dollar value of products. To get the benefit of accounting data it is necessary to learn how the accounting system functions, why the accountant wants information in dollar form, and how to translate his data into terms appropriate for our analyses.

Why know accounting? Understanding the accounting system also helps us see how management judges our performance by reading the balance sheet and the profit and loss statement. There is a trend toward making operating supervisors of departments (or divisions) responsible for profits within their areas. To meet this responsibility the manager must understand accounting principles, and the relationship between his standards of measure (standard costs, manpower, hours, etc.) and the accountant's standards (percentages and dollars). This is because he must take corrective action which shows up favorably by both standards—by both, because he must both take the right action, and get credit for it. ♦

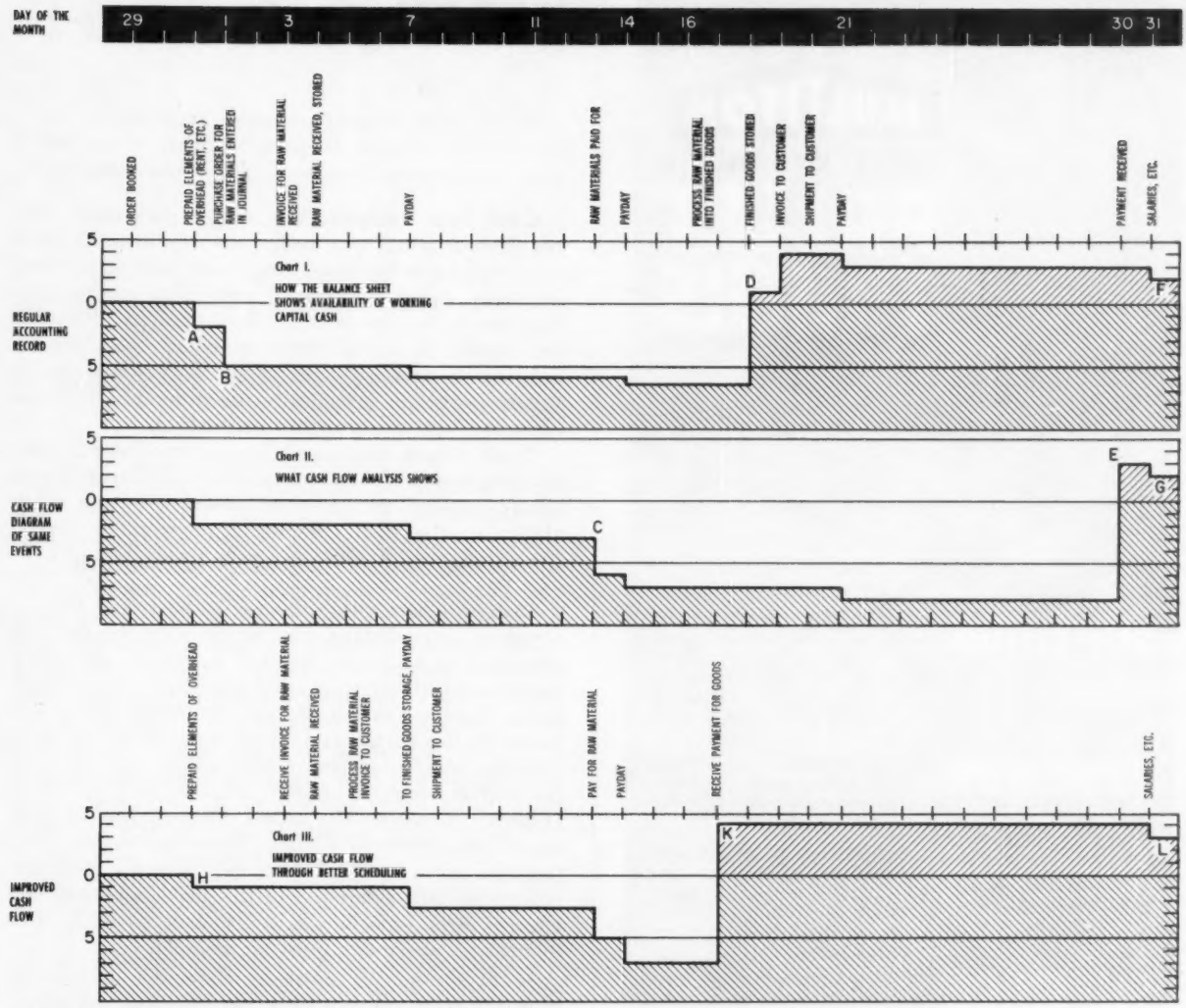
Tipping the balance sheet your way

A look at the balance sheet shows the items discussed by Ralph Sims. How can you make them favorable to you?

Purge inventories. To you the most important item on the balance sheet is "Inventories." Be sure it isn't swollen by the remains of dead jobs. The cost of experimental work, botched jobs, cancelled orders may all be hidden in the total. Root them out and have them written off. Don't rely on current files of job tickets; the questionable jobs have a way of escaping from routine files. Examine your master register of job numbers to be sure that all old serials have been closed.

Be sensitive to shrouded contraptions in dark corners of the shop. They are often mummies of dead jobs. Poke into storage, too. Those cases holding 10,000 thingumabobs, perched atop a rack, may be the raw material remains of a killed job.

In finished goods storage you may find a few corpses. Suspect anything that doesn't move, that accumulates dust, is hidden or out of the way, or lacks proper job identification. Sometimes it pays to be a detective: one Hawkshaw got curious about scores of fancy ashtrays used in his company's offices, found they were on the books as expensive partly-machined stainless steel gear forgings.



CASH FLOW ANALYSIS based on a hypothetical case.

Watch "in-process" totals. Balance sheets often class inventory as "raw material," "work in process," and "finished goods." "Work in process" needs watching because it is hard to take physical inventory of materials being worked on. Take advantage of any work stoppage to make an actual count of material in process. Then compare your count with the figure on the books.

Why police inventory? There are four reasons. Any extra *material* on hand clogs up the flow of production or uses space you need. This is why you are directly concerned. Second, if you have useless material, money is tied up in it. Get it out, even at salvage rates. Make better use of the money. Third, you may find that items on the books have disappeared, evidence of waste or dishonesty. Fourth, you are probably being judged by what the balance sheet tells about inventory totals.

Analysis by ratios. A balance sheet reveals a lot about your performance, and the business as a whole. The trick is to examine ratios. Example: Take annual net sales from the P. and L. statement, divide it by average inventory, and you have a figure for turnover.

Another useful ratio: Divide inventory by capital (debt + owner's equity + surplus). If this fraction is getting larger, or is out of line with competition, an explanation is needed. If the fraction is going down, it is probably a good sign, but it might also mean that someone is getting chintzy about having enough material on hand to do the job right.

It may pay to watch the trend of other ratios. Get the figures from *successive* balance sheets and P. & L. statements. Here are some ratios worth attention:

Equipment/Direct Labor
Inventories/Accounts Receivable
Inventories/Accounts Payable
Inventories/Interest Payments
Equipment/Net Sales

Sometimes you need to understand bookkeeping to defend your own good work. For example, if your company uses FIFO inventory accounting, when prices are rising the accountant's figures make it look as if your inventories are increasing even when you have moderately reduced the number of physical

SUPERIOR OPERATION AT LOWER COST!

MULTITON
FULLY HYDRAULIC
PALLET TRUCKS
2200-3000-4400 POUND CAPACITIES

SUPERIOR LIFT SYSTEM ■ Leakproof, one-unit hydraulic system — machined oil passages ■ magnetic oil filter ■ overload, overflow valves ■ all valves accessible from outside ■ hard chrome-plated pistons ■ honed cylinders.

SUPERIOR CONTROL ■ Hand-operated maximum 7¾" lift in three strokes ■ lowering speed remains constant ■ pallet entry and exit rollers.

SUPERIOR CONSTRUCTION ■ Torsion-proof hardened joints ■ box-section type push rods ■ knee-action axle mount ■ taper roller bearings on load rollers ■ low, tapered forks for maximum clearance.

SUPERIOR EXTRAS ■ Exclusive shoe-type brake ■ variety of wheels to fit every requirement ■ all standard fork-lengths ■ skid adapters.

OTHER PRECISION-BUILT MULTITON EQUIPMENT IN A WIDE RANGE OF CAPACITIES, INCLUDES . . . ELECTRIC PALLET TRUCKS ■ HYDRAULIC AND MECHANICAL SKID TRUCKS ■ HYDRAULIC LIFT TRUCKS ■ POWERED PLATFORM TRUCKS ■ SPECIAL PURPOSE TRUCKS & OTHER EQUIPMENT

. . . AND FAMOUS MULTITON ROLLER SKIDS
TWO MEN CAN MOVE HEAVY MACHINES AND EQUIPMENT
up to 300 tons, with Multiton Roller Skids and suitable tractive power. They lay own track and swivel easily in close quarters. Junior Kit available for loads to 6000 lbs.
For full information or free demonstration of Multiton equipment, write:
STOKVIS MULTITON CORP.
18 SECATOAG AVE., DEPT. M-4 PORT WASHINGTON, NEW YORK
In Canada: Griswold Engineering Ltd., Montreal and Toronto
Circle 111 on Reader Service Card

units in stock. There are other wrinkles in FIFO and LIFO systems. It pays to figure them out if your management likes to think in accounting terms.

Cash flow analysis. The accountant's totals may not fit your needs very well. One way to make them more helpful is by translating them back to physical measures, using averages of cost, labor output, etc. Another technique is cash flow analysis. For this you record the actual dates on which the company receives or pays out money. The first two charts in Figure 2 explain graphically the difference between *cash flow* and conventional accounting.

These charts are based on a hypothetical case, showing how one single job, such as simple conversion of raw material into finished products, affects availability of the cash component of working capital (Working capital includes cash, receivables, inventory.)

At A in Chart I the order is booked, and the accountant immediately charges it with burden, or overhead, to take care of rent, insurance, and other expenses which are prepaid. A day later (B) someone issues purchase orders for raw materials. These are posted in the Purchases Journal, credited to Accounts Payable, and in orthodox accounting indicate that the sum of money committed is spent. As C on Chart II shows, however, the actual payment for the purchase (on 2-percent-10-day, 30-day-net terms) will not take place until the 13th day after the purchase order goes out; awareness of this may make a difference in costs, especially if you finance by notes, and interest for every day must be included.

At D the job is finished. Here the accountant probably picks up the value, debiting finished goods inventory, at cost of labor, burden, and raw material. (Carrying finished goods at market is questionable. The *lower* of cost or market value is preferable.) After the entry at D is made, a trial balance would show that the business has plenty of money. But the cash flow analysis reveals that there is actually less in the till than at any other time. The cash position doesn't improve until the 30th day (E on Chart II) when the customer pays up. Both charts are the same at F and G, indicating net profit.

The first two charts explain the difference between accounting records and cash flow. Chart III demonstrates one use you can make of this analysis. Improve cash flow by moving goods faster, to get processing completed as soon as possible after receiving raw materials (J). If you process on the 5th and 6th, invoice on the 6th, ship on the 8th, then you should get payment on the 16th. This reduces tie-up of capital and space, so your overhead is less (H), and you are ready to start a new job on the 17th, with the money in hand to finance it (K). Profit (L) is higher.

It is easy to do this on paper. For suggestions applying to the harder situations encountered in real life, review "Putting the Control Concept Into Practice" (MHE, June, 1961). ♦

How they're maintaining . . .

PALLET REPAIR

Can you repair pallets economically?

Some say, "Fix it. It's cheaper than building a new one." Others say, "Throw it out. It's not worth the time and bother of repair."

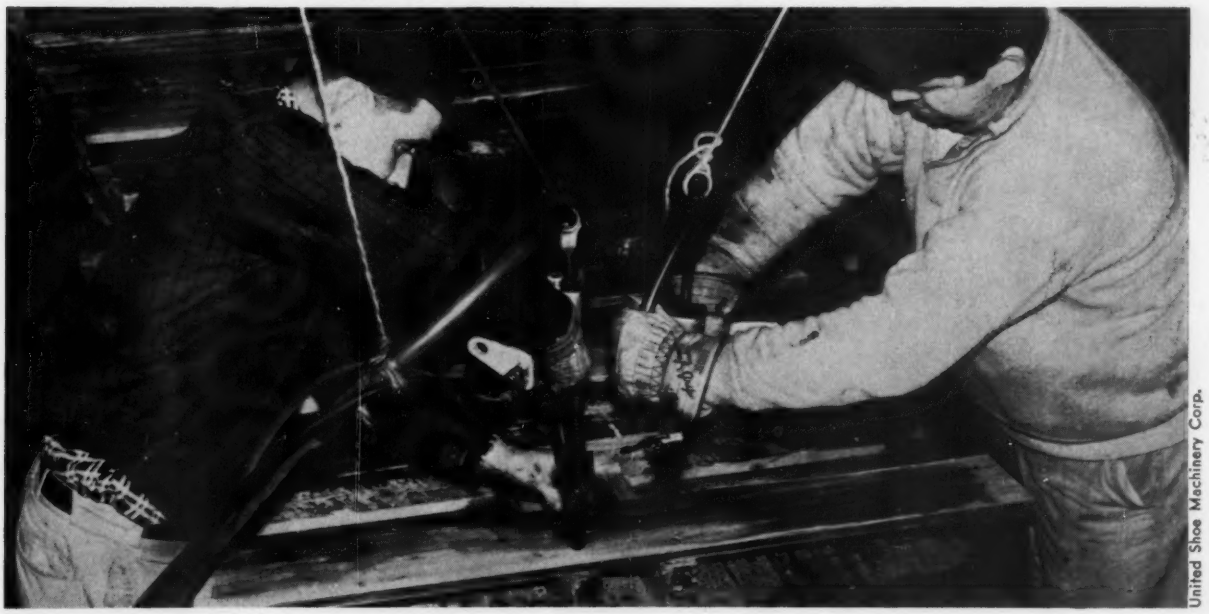
Each school has its boosters, each often with reason. A furniture maker might prefer to repair its own pallet. A fruit packer might not. Many manufacturers venture into the side-line of pallet repair, often find it a loss. The difficulty: workloads fluctuate widely. A high inventory one month and you're using every pallet. The repair crew then loafs. When orders empty the pallets, you find many that need repair.

Professional pallet repair. This is what gave rise to the expendable pallet, and also to the pallet repair business. You usually can find a pallet-repair firm within 50 to 75 miles of you.

Pallet Repair Company, Kearny, N. J. uses its own flat-bed trailer trucks and accepts deliveries and pick-ups by customers' vehicles. Their service is so fast that trucks sometimes deliver a load of broken pallets and wait till they've been fixed. More usual delivery time is 3 days, with a regular 24-hour emergency repair service for customers with limited pallet inventories.

Lumber comes in by rail and truck. They store it in near the outgoing end of the line. They store incoming damaged pallets in the yard, or unload them directly at the building's single truck dock. They start them on dead roller conveyors on a U-shaped course through the building. Ripping crews remove all broken boards and frame members. They push the stripped pallet along to the next station where they stack precut lumber. They lay new pieces in place, nail them firmly, and at the final station, do any necessary edge and corner repair.

Improved method. Pallet Repair Co. recently more than tripled its speed without adding employees or floor space. They bought automatic nailing guns. They substituted a stronger and harder machine-grade nail with spiral flutes. The new nails (or drive screws) dump from bulk containers into the hoppers of the guns. There, they automatically aline and feed through flexible hoses. Two operators stand on opposite sides of the roller conveyor, work at the same time on one pallet. The nailing guns hang from counterweighted cables. The operator presses the nose of the nailer lightly against the work, then pulls the trigger. Nail after nail shoots home with uniform force. The clean, sharp action avoids splitting, increases holding power,



United Shoe Machinery Corp.

They nail on a steel surface when clinching is specified. The force of the blow clinches the point.

The nailers are air-drive and portable. Partners Hugh J. Ward and George W. Stickle point out that their repair business now centers around the speed and capacity of the nailing guns. "We found out that a man can nail five times as fast with a gun, and do it without a long break-in time."

2 PALLET INSPECTION

FAULTY PALLETS cripple automatic material handling machinery. No pallet loader, depalletizer, or automatic truck unloading system can overcome the burden of pallets with cracked or broken boards, dried out lumber.

Matter of fact, you don't need automatic machinery to get into trouble. A faulty pallet at the bottom of a tier may topple a load of materials, jam the area. And imagine the wasted and inconvenience a broken bottom pallet could cause to a load in transit. Worst of all, employees can be hurt. Accidents can occur due to damaged pallets.

A solution. Many companies today have pallet inspection-maintenance programs. Automatic inspection machines catch repairable pallets before they get beyond repair stage. Users report a considerable decrease in pallet replacements.

Here's how the inspection works in a large food processing plant. A pallet dispenser equipped with special lifts enables the inspector to scan tops and bottoms of pallets. By pressing buttons, the inspector can dispatch the pallet onto an automatic pallet stacker (#1) where they're picked off and repaired, or, if satisfactory, he can send them on to a stacker (#2) from where they're returned to work. The magazine of the pallet dispenser accommodates up to 20 pallets at a time.

Austin-Western

3 ROLLING STOCK

THE DELAWARE & HUDSON RAILROAD CORP. repairs cars in repair shops at Colonie and Oneonta, N.Y.

The road wanted to buy mobile equipment for transporting a variety of materials. The road specified these things:

- The operator to see the load carried at all times.
- Power-actuated boom and swing.
- Compact and easy-to-manage controls.
- A boom that would extend and retract hydraulically.

The road bought two hydraulic 3-wheel cranes. They operate self-propelled with front-wheel drive, have rear trunnion dual steer. Capacity: 5 tons 2-feet in front of the bumper bar. All booms and cable hoist mechanisms operate hydraulically. The boom slues 110

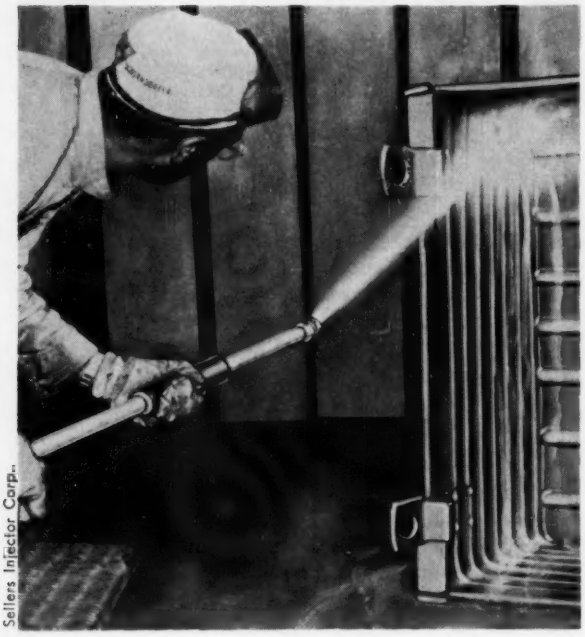
Alvey Conveyor Mfg. Co.

degrees to either side of the center point, extends to a maximum of 18 feet, 7 inches working radius.

How they're used. D & H uses the cranes on track operations where they repair rolling stock as part of equipment maintenance.

The boom and hook enables the operator to see loads at all times, an important safety feature for railroad work. Loads are bulky, and the operator has to take special care not to ram other objects, and naturally he must protect coworkers.

Arrangement of levers and instruments about the operator's seat makes efficient crane operation. Full use of hydraulics in the crane design provides smooth operation, permits inching of loads to precise positions without jarring or slipping. D & H finds the cranes equally useful for indoor and outdoor work.



Sellers Injector Corp.

4 HANDLING EQUIPMENT

MOST PLANTS find it a nuisance to clean stock containers, material handling equipment, and components. It often demands lots of expensive and laborious handwork, and hazardous solvents. Good many concerns have outside contractors tackle difficult cleaning jobs.

Ford Motor Company, however, applies new cleaning techniques. Result: they save up to $4 each on the cost of cleaning stock containers. They save hundreds of man hours on some cleaning jobs. On others, they've eliminated the use of dangerous solvents.

Responsible are powerful hydraulic jet cleaners stationed throughout many Ford plants. These cleaners combine water, plant steam, and detergent in a high pressure hot liquid jet that quickly and thoroughly removes dirt and grease.

The savings. Originally, they used the jets to remove drawing compound from dies. But they found the cleaners so successful, they now use them on anything they can move into the cleaning area. Savings are significant. A private contractor used to clean stock containers for up to $4 each. Now two Ford men with the jet cleaners clean 50 containers in 4 hours.

Cleaners in the garage clean parts, engines, and fork lifts. The cleaners deliver hot water at a discharge pressure 2 to 20 times the input steam pressure. This not only makes a jet, or hydraulic scrub brush, but also results in a high stream velocity in excess of 120 m.p.h. at 30 feet from the nozzle.

5 INDUSTRIAL EQUIPMENT

Cushman Motors

YOU CAN QUICKLY TRANSPORT a welder and his equipment to a job by mounting the welding equipment on a utility vehicle.

Plants using this system say their maintenance welding equipment goes speedily wherever it's needed, inside or outside the plant.

The rigs generally have arcwelding and gaswelding equipment. Other welding equipment may also be mounted if needed.

Cost for building this vehicle averages $40 for labor and materials, not counting the welding equipment. The $40 covers a 2-inch channel iron frame under the vehicle's flatbed to raise it for additional wheel clearance, and building racks for the welding equipment.

The gasoline-powered unit used for the welding rig measures 104" x 48" x 46½". Wheelbase: 67½", Ground clearance: 4½". Power: 4-cycle 7.95 hp engine. Suspension: semi-eliptical rear wheel springs. Payload: 800 lb. ♦

Grab that maintenance authority!

WHAT HAPPENS if you don't? Material handling equipment will be treated like a stepchild while production machinery gets loving care.

This depends greatly on the size of your company and on your handling equipment. Large firms with a lot of rolling stock often organize separate material handling maintenance departments. Smaller firms may have their general maintenance do the job. Firms with mostly conveyors and overhead equipment may not need separate maintenance for them.

The question of separate maintenance boils down to how much it costs. And you must answer that for yourself.

But one thing for certain! It's senseless to slough off maintenance of material handling equipment. Sloppy maintenance leads to breakdowns that affect more than material handling equipment alone. It affects production that depends on handling equipment.

So we suggest that the material handling man grab that maintenance authority, at least make sure his equipment gets the best maintenance. Let's visit several plants, see how they work this out.

Maintain your own handling equipment

By EDWARD C. GUMPF, *superintendent*
Transportation and Material Handling
Steel & Tube Division
The Timken Roller Bearing Company.

FOREMAN of material handling maintenance, John Browning (left), talks straddle carrier maintenance with Ed Gumpf.

IN MY DEPARTMENT, drivers and mechanics are responsible to me. We see that mobile equipment is available. Therefore, we should be responsible for its maintenance.

We advise material handling men to stay on top of maintenance. With operation and maintenance under one head, you get better control and reduce equipment abuse.

Operation and maintenance of material handling equipment are so close it's hard to say where one or the other starts and stops. The Timken Roller Bearing Company has enjoyed the fruits of combining these two functions since the inception of our material handling program.

Our equipment. We maintain more than 100 pieces of mobile equipment. This includes 19 straddle carriers (up to 60,000-lb. capacity), 16 lift trucks of 20,000-lb. capacity, 30 ram trucks, lift trucks, and front end loaders, plus sweepers, powered wheelbarrows, and others. The only equipment we run but don't maintain is railroad rolling stock, such as engines, rail cars. These are repaired by general maintenance, which has equipment for these jobs.

I don't think general maintenance is in a position to maintain our equipment the way we want it done. When multiple units are down at the same time, our 5 to 10 dollar an hour units cannot receive maintenance priority over mills worth perhaps $500 an hour. Controlling both work and maintenance we can apply a priority to repair certain mobile units to assist

Concluded on next page

DISCUSSING a crane hook are Tom Bamford (left) and Ed Gettling, maintenance supervisor.

Keep maintenance centratized

By TOM BAMFORD, *superintendent of manufacturing*
Electric Controller Division, Square D Company

WE TREAT material handling equipment the same as any machine on which we depend. Therefore, it's serviced under general maintenance. To us, material handling equipment is basic, must keep going. So there's no fight over equipment maintenance priority.

Our system works well because, with 250 production workers, we're not too large. We have more than 50 cranes and hoists, 5 fork trucks (4 battery and 1 gasoline), many hand trucks, and a few conveyors.

Responsibilities. General maintenance is responsible for all material handling equipment and machinery. The maintenance supervisor reports to the works manager. Supervision of material handling equipment is under management of the function being served. For example, material handling equipment at receiving is under the receiving foreman. Handling equipment in the storeroom is under the storekeeper.

If our maintenance crew were a great deal larger—needed more supervision—it might be logical to divide its functions. We might organize some of the maintenance men under a material handling maintenance foreman and gain the benefits of specialization. After all, fork truck maintenance differs from punch press maintenance. But we still feel all maintenance men should report to a maintenance superintendent.

No tight rein. I don't feel a material handling man must keep his eye on his equipment . . . if general maintenance is doing a proper job. We rely on operators to tell us if something isn't working properly. And we have regular preventive maintenance, periodic inspections.

Maintenance men oil, grease, clean, and inspect

Concluded on next page

MH maintenance is a specialty

By PAUL W. WATT, *superintendent, Factory Service*
The B. F. Goodrich Co.

THE MATERIAL HANDLING MAN should control material handling maintenance. Don't let general maintenance into this picture at all. We've been doing our own since 1943, realize these benefits:

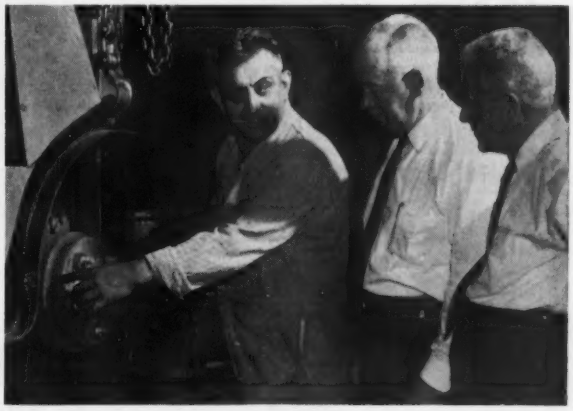
1—More economical.

2—Less downtime, don't have to take our turn with our equipment as we would if general maintenance were in charge.

3—Develop our own specialists who know just how to maintain our equipment.

4—Keep minimum inventory of parts because our people know just what they need.

Our maintenance staff. Goodrich in Akron has more than 300 pieces of rolling equipment, fork trucks (electrics, gasolines, diesels), front end loaders, railroad and yard cranes, highway trucks. We maintain



LIFT TRUCK with wheel removed gets the attention of (l to r) Joseph Posinelli, maintenance workman; Paul Bentz, manager of transportation, Akron plants, and Paul Watt.

all of these, plus the plant elevators.

Our maintenance staff of 14 mechanics is headed by a foreman (chief mechanic). He reports to a shift foreman, general foreman, or manager of transportation, Akron plants. The mechanics do as complete a job as possible. That way, we get the equipment the way we want it when we need it.

We have a thorough preventive maintenance program, keep detailed records of battery and truck life. We have electrics 40 years old. Last year we replaced two in continuous service since 1919.

Speedy battery changes. Our battery charging (120 at a time) and repair station is in the basement, off a main tunnel. Eighty rider trucks get

Concluded on next page

Circle 76 on Reader Service Card

Power Truck M.O.B.ILITY

MAGLINER MAGNESIUM PALLET DOLLIES free-up your power equipment for the big jobs and longer hauls. Put a Magliner under every pallet load and its ready to roll . . . quickly, easily, *economically*. A small investment that pays big dividends, Magliners are the practical solution to loading bottlenecks . . . high loading costs. Made of magnesium, Magliner pallet dollies are easily handled by one man . . . carry loads up to 4,000 lbs., safely, smoothly on large 3¼" rollers. Tough, rugged, welded magnesium construction. Dependable, long-life service! 14 standard models and sizes.

Write for Bulletin P8-1

Magline Inc. • P.O. Box 328 • Pinconning, Mich.

Canadian Factory—Magline of Canada Ltd., Renfrew, Ont.

D&M CANVAS CAB ENCLOSURES

RETAIN FULL PRODUCTION IN ANY WEATHER OF YOUR FORK LIFT TRUCKS, TOW TRACTORS AND BULLDOZERS NOW AT REMARKABLE LOW COST

- **QUALITY CONSTRUCTION**
  Heavy army duck canvas which is waterproof and mildew-proof. Can be rolled up in mild weather.
- **VISIBILITY & SAFETY**
  Clear vision assured by windshield and left, right, rear and roof panels of unbreakable glass. Screen insert in rear checks carbon monoxide. We can also furnish this with safety glass windshield and electric windshield wiper on request.
- **EASY TO GET IN AND OUT**
  2-way zipper can be opened from inside or outside. Will not rust, freeze or corrode.

WHEN ORDERING
When ordering give make, model, capacity and specify whether machine has factory guard or LP gas tank.

FRAMEWORK
Framework custom made for you if your machine is not equipped with factory guard.

D&M TRUCK TOP COMPANY

Phone WE 3-1613

12186 PETOSKEY AVE., DETROIT 4, MICHIGAN

Circle 34 on Reader Service Card

HANDLING MAINTENANCE

GUMPF—
our total operation most effectively. Much material handling effectiveness would be lost if the maintenance of equipment were dependent upon another separately-controlled maintenance department.

How we're organized. A general foreman, railroad, and general foreman of material handling, report to me. A maintenance foreman, and many material handling foremen report to the material handling general foreman. The maintenance group includes an assistant foreman; two men, one for parts, the other for records, and 16 to 24 mechanics, depending on the level of business.

Our drivers are required to clean their vehicles and assist in lubrication and repairs as deemed desirable by supervision. We feel this furthers the driver's interest in his vehicle.

Small difficulties can be eliminated by the control of maintenance and operation under one head.

Size governs combined mobile equipment operation and maintenance, or maintenance by the general maintenance staff and operation control by the operating units. A small operation cannot afford to establish separate control and a large company cannot afford to be without it. ♦

BAMFORD—
during slow shifts. Production workers usually only change coolants and wipe down a machine. Maintenance is responsible for the fork trucks. They're delivered to a central station at the end of a shift. We charge the battery trucks each night.

We schedule maintenance to keep production loss low. For example, we make big electrical changes on Saturdays. Another example: we discovered a defective pitted rail holding up a 10-ton crane. We put a big job on the machine serviced by the crane. Therefore, the machine didn't need the crane while the rail was changed.

Every piece of equipment has its own lubrication chart. We don't wait for breakdowns. ♦

WATT—
their batteries here. Our drivers push out a spent battery and pull in a newly-charged one in 30 seconds. We use a small ramp to get the truck to roller conveyor height, then shove the batteries in and out.

Standardize. We recommend handling equipment for other Goodrich plants and warehouses around the country. We approve all their handling equipment buying. We specify no brand of equipment. But we insist that each plant use nothing but one make. This way, the maintenance men at these plants know exactly how to repair the equipment, become masters of one instead of dabblers in a large variety.

General maintenance only cares for the production handling equipment, such as conveyors, positioners, and such. There's never been the slightest question at Goodrich about our maintaining the rolling stock. ♦

3 ways to get maximum protection with minimum packaging

ENDS

A single piece of corrugated board and steel strapping at each end of these 10-foot lengths of tubing make a neat, square package that places effective protection where it is needed, takes little material, and is easy to handle, stack, store and ship.

Two men, each with a Signode M2 power strapping machine, stack, cap and strap 270 packages per day, as against 130 packages per day with hand strapping tools.

EDGES

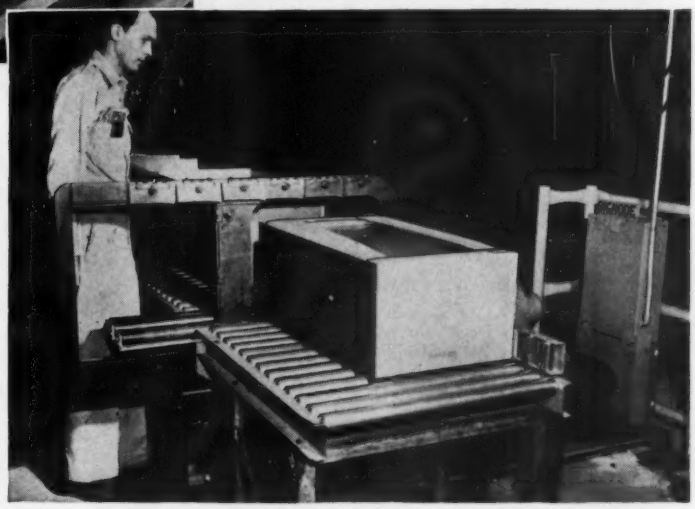
Long sheets of laminated plastic are paper wrapped, then edges are enclosed in strips of corrugated. Steel strapping is automatically applied at just the right tension to make a sturdy unit package. Savings in packaging costs are substantial, protection is practically perfect.

Operatorless strapping with a Signode M20 power strapping machine. Conveyor is powerized. Strap placement is controlled by a conductive ink mark on the package.

4 SIDES

Metal shelving and components are strapped in these containers that are open top and bottom. They are typically 3′ long, 1′ high, and from 9″ to 36″ wide. The same machine straps bundles of angles or posts that are only 3″ to 4″ square. Production is up almost four times, package unit cost is down, protection excellent.

One man and this foot-pedal-operated power strapping machine strap over 1100 containers a day. The machine has an adjustable strap chute to assure maximum strapping speed.

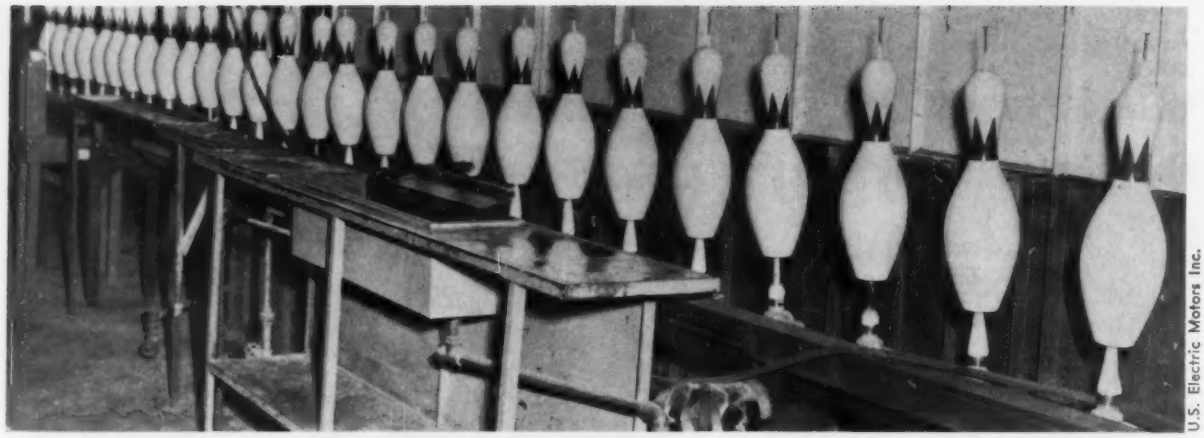


■ These three ways to save suggest what is accomplished when the strength of quality steel strapping is used with skill and imagination. Write for free Minimum Packaging Idea Kit.

First in steel strapping

SIGNODE
STEEL STRAPPING CO.
2618 N. Western Avenue • Chicago 47, Illinois
Offices Coast to Coast, Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Circle **107** on Reader Service Card



U.S. Electric Motors Inc.

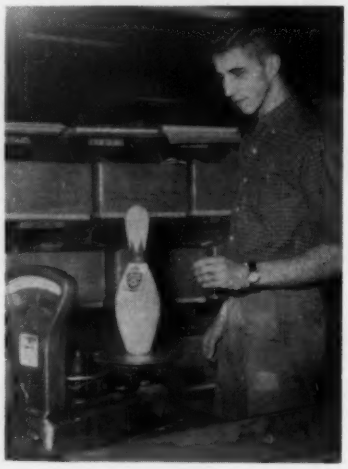
AFTER SUCCESSIVE dips in plastic, bowling pins ride this conveyor to inspection stations. Special drive system has coordinated start-and-stop control and explosion-proof motors.

Even ride carries bowling pins to plastic dips

To MAKE bowling pins automatically, the Brunswick Corporation required fully explosion-proof drives to synchronize five variable-speed conveyors. The controls were needed to ensure point-to-point transfer.

At their Bowling Division, Muskegon plant, they hit on using frequency-controlled a.c. motors and regulating their speeds with U.S. Varidynes. These provide synchronized variable speed control for the system by increasing or decreasing the frequencies of the current fed to the drive motors. This speeds or slows motor speeds.

The system. Pins go onto an input conveyor. It automatically racks them for dipping, provides point-to-point transfer through the control of the drive system with coordinated start and stop control.



EXACT WEIGHING of each pin is part of inspection. Underweight pins are redipped in plastic to bring up weight to standard requirement which gives pins impact resistance.

They dip the pins six to eight times in various plastics to give a high impact-resisting coating. Racks of 6 to 8 pins lower from the conveyor system into pools of plastic. The extremely explosive atmosphere requires explosion-proof motors.

Brunswick's engineers chose this system because its voltage remains constant. It changes speeds by changing frequencies. There's no speed drift.

One power unit. The single power unit takes care of the entire system of five multimotored conveyors. It converts 60-cycle current to frequencies ranging from 20 to 100 cycles. It gives infinite stepless speed changes within a 5:1 ratio.

Push-button speed control for the system is carried out from a master control panel. One or two operators guide the entire process.

As transfer is point-to-point on all five conveyors, there can be no cumulative error in handling the racks of pins. They regulate speeds of the conveyors so there's time for drying each plastic coating as the pins proceed from one dip to the next. The conveyors stay in perfect step, regardless of over-all speed increases or decreases.

Automatic transfer. After the successive dips, the pins transfer automatically to a conveyor which carries them to inspection stations. Careful weighing weeds out underweight pins which are given one or more additional plastic dips to bring them up to standard weight. ♦

Bendix announces

TWO GREAT NEW COMPONENTS FOR ZENITH LP FUEL SYSTEMS

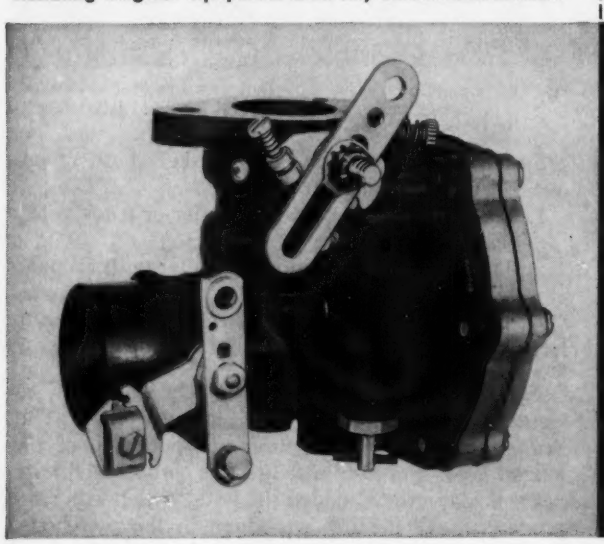
1 ZENITH PRESSURE CARBURETOR

Greater safety and efficiency in fuel control are built into this new Zenith® LP carburetor. In its development, our engineers drew upon their wide experience in other fields of carburetion—particularly aircraft pressure carburetion, where Bendix patents exist. The new LP models offer many advanced features: Both fuel economizer and final regulator are built in. The carburetors are fully balanced, can have fixed or adjustable fuel metering, and are simple to service. Two sizes available: 1″ S.A.E. (Model PC 1-8) and 1¼″ S.A.E. (Model PC 1-10).

Zenith Supplies more LP Gas Carburetors for Materials Handling Original Equipment than any other Manufacturer.

2 ZENITH HOSE LINE UNIVERSAL VAPORIZER

As the high-performance companion to the new pressure carburetor, we have designed a new hose line vaporizer. It mounts in any position in upper or lower radiator hose. For additional capacity on large engines, vaporizers can be mounted in both hoses. The unit, including the head, is cast from aluminum for light weight. The casting includes a pad for bracket or brace support in mounting.



Write for information on Zenith's LP Gas Carburetor School

Zenith Carburetor Division

THE Bendix CORPORATION

696 HART AVENUE, DETROIT 14, MICHIGAN

Circle 14 on Reader Service Card

PACKAGING & SHIPPING IDEAS

Test Results: how good are powered floor conveyors?

Official U.S. Navy photograph

OPERATOR holds remote control switch, guides 40 x 48" pallet load inside a truck.

ALWAYS INTERESTED in new ideas, the Navy tested automated truck cargo handling at the Naval Supply Center, Bayonne, N.J. The Navy, which tests many new products and machines, bought and tested a Moto-Vator push-button truck floor conveyor.

The results of their tests should not be considered an endorsement by the Navy. But you can use the facts and figures.

The Moto-Vator moves pallet loads inside a truck. It's a powered floor conveyor, mainly used in van bodies. It consists of an endless roller chain (or chains) powered by a reversible battery-powered motor. Pallets ride on supports of alloy aluminum. Each plate has an aluminum chain cleat. The plates are coated with a nonskid coating so the pallets ride securely. For general cargo of mixed loads, movable floor segments are used. The pallet supports or floor segments engage the chain and roll on nylon bearing wheels.

The Navy followed a 7-point test program as follows:

TEST OBJECTS	FINDINGS
a. Physical characteristics	The Moto-Vator automatically restricts you to mechanized operations because manual loading is difficult once Moto-Vator is installed.
b. Time to load and unload	Significantly faster than conventional manual loading, takes less manpower.
c. Durability	Adequate, repairs easy to make.
d. Best load type	Model tested worked best on standard 40" x 48" palletized loads.
e. Operator's Qualifications	Unskilled help can master the equipment and trailer loading patterns.
f. Ease of maintenance	Maintenance program is suitable.
g. Field operation	Indicates the Moto-Vator as a good time and labor saver.

Special findings. The Navy makes these recommendations and findings:

1. Install the equipment in a trailer or truck with a rectangular floor.
2. The average time to load a trailer with 12 pallet loads is about 21 minutes, to unload, 10 minutes. The difference is due to the fork truck operator having to place the load on pallet supports.

Field operations. For three weeks, the Navy assigned the trailer to a dry provision warehouse. They studied the system in routine transportation of palletized loads from the test site to nearby activities.

Each day, they loaded it with palletized cased provisions. All loading was done in the warehouse. Loading time with two men working in the truck used to take 2 hours under old methods. The Moto-Vator cut this to 30 minutes, eliminated the need for the men working inside the truck.

The trailer was unloaded at a terminal in about 30 minutes. Two men normally assigned for unloading were not used. Total savings: 10 man hours per trip. Motor-Vator is manufactured by H. S. Watson Co. ♦

Change!

Are your storage facilities modern and flexible for maximum profit in these changing times?

Just as a chick finds his shell inadequate to cope with his growth, old fashioned storage methods can be too confining for business changes. When you need *more* storage space, or when inventory adjustment must be made . . . SPEEDRACK adjusts to your needs.

Imagine one adjustable rack system that adapts itself to infinite variations. Visualize free standing storage racks from floor to ceiling, erected or changed quickly by unskilled labor! Only SPEEDRACK—the proven and *perfected* boltless, adjustable steel storage rack—offers this adaptability.

The secret of SPEEDRACK's unmatched strength and versatility is an exclusive, patented, self-locking connector, adjustable on 2″ centers, that distributes weight load on four separate points. *No other rack has it!* Available in selective, cantilever, "drive-in" and others according to your requirements.

There have been thousands of SPEEDRACK installations. May we show you pictures of installations in businesses like yours?

Write:

SPEEDRACK INC / SKOKIE ILL USA
IN CANADA / SPEEDRACK LTD / WESTON ONT

speedrack®

Circle 114 on Reader Service Card

BULLETINS CATALOGS FILMS

How Packages are Tested

Folder shows how Gaylord Container tests packages for resistance to dropping, vibration, and impact. Explains meaning of National Safe Transit Committee safe transit label.

Gaylord Container Div., Crown Zellerbach Corp.

Circle **401** on Reader Service Card

To Load, Unload Faster

Powered roller conveyor installed in floor of trailer loads or unloads palletized material in minutes. Six-page bulletin describes system, shows photos of installations.

Alvey Conveyor Mfg. Co.

Circle **402** on Reader Service Card

Report on Cooling Trucks With Liquid Nitrogen

An interim report from U.S. Department of Agriculture describes tests made of use of liquid nitrogen as truck or trailer refrigerant. The system is simple: insulated cylinders of liquid nitrogen are carried in truck at low pressure (15 psi.); under thermostatic control the liquid is sprayed from perforated pipes running the length of the truck. Tests of this method were made in regular delivery run of frozen food distributors' trucks. Tests show that method holds promise of maintaining cargo temperatures at satisfactory level, but are not yet conclusive. Order direct from U.S. Department of Agriculture to obtain copy of *"Test of Liquid Nitrogen Refrigeration System Installed in Frozen Food Delivery Truck,"* (AMS-426) Agricultural Marketing Service, Transportation Facilities Research Division, U.S. Dept. of Agriculture. December, 1960. Free.

Wheeled Gantry for Piggybacks

How self-propelled gantry crane can straddle flatcar to pick up piggyback highway trailers from car shown in 4-p. bulletin, No. 18,000-18. In loading or unloading crane can rotate trailers 15°, to line up trailers with car, or set them down so tractors can hook up easily.

Manning, Maxwell, and Moore, Inc.

Circle **403** on Reader Service Card

LP-Gas Regulator, Conversion Kits

Two stage LP Gas vapor system regulator for adapting small air-cooled engines to use of LPG. Compact, it weighs only 18 oz. For mounting regulator, etc., kits are available to fit carburetors of Briggs & Stratton, Clinton, and Wisconsin engines. Bulletin 6101 shows typical installation, kits.

Zenith Carburetor Div., Bendix Corp.

Circle **404** on Reader Service Card

Lift Truck Carton Clamp

Clamp attachment enables Clark trucks of 2,000 to 5,000 lb. capacity to handle carton loads without pallets. Easily attached or removed from fork carriage. Bulletin SS-1666 gives sizes, capacities, illustrates use and mechanical features.

Clark Equipment Co.

Circle **405** on Reader Service Card

Easy-to-Read Crane Scales

To make crane-hook scale easy to read, it has read-out dial that can be placed 50 ft. from hook. Bulletin M-40 show the dial, the load element, and portable cart furnished to carry them.

Martin-Decker Corp.

Circle **406** on Reader Service Card

Woven Wire Slings

With beautiful pictures manufacturer shows typical applications of wire slings, their advantages; then, having convinced you, he tells you how to select the proper width, length, and specify details. Handsome 24-page catalog.

Cambridge Wire Cloth Co.

Circle **407** on Reader Service Card

Hoist Overload Switch

Dyna-Switch cuts off power when hoist is overloaded. Consists of forged flexing beam and microswitch. Can be installed at hook, as part of hoist support, at dead end of cable, etc. Six-page folder describes 3 models, each available in either 5 or 10 ton capacity.

W. C. Dillon and Co., Inc.

Circle **408** on Reader Service Card

Troughing Conveyors

Bulletin gives 22 features of natural troughing belt conveyors with capacities from 150 to 2,600 bu. per hr. Tie-rod construction makes assembly easy. Expand length by adding sections. All bearings sealed. Drives, other moving parts guarded for safety.

Finco, Inc.

Circle **409** on Reader Service Card

User's Guide to Vacuum Handling

"User's Guide" starts with fundamentals of vacuum handling, defines all terms, provides pictures of typical installations. Shows pads, power units, hoist attachments used for vacuum handling of metals, glass, wood, stone, concrete, plastics.

Vac-U-Lift Co.

Circle **410** on Reader Service Card

Grabs

All kinds of grabs for use with hoists and cranes described in Bulletin G-3A. Self-actuating and powered units, for handling metal coils, sheet, bars, billets, tubing, paper rolls; special designs pick up drums, crates,

Continued on page 73

READER SERVICE CARD

Material Handling Engineering

Card Invalid Without Company Name

AUG. 1961 — Do not use after Nov. 15, 1961

NAME _____ TITLE _____

COMPANY _____ KIND OF BUSINESS _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

ADVERTISERS

1	16	31	46	61	76	91	106	121	136	151	166	181	196	211
2	17	32	47	62	77	92	107	122	137	152	167	182	197	212
3	18	33	48	63	78	93	108	123	138	153	168	183	198	213
4	19	34	49	64	79	94	109	124	139	154	169	184	199	214
5	20	35	50	65	80	95	110	125	140	155	170	185	200	215
6	21	36	51	66	81	96	111	126	141	156	171	186	201	216
7	22	37	52	67	82	97	112	127	142	157	172	187	202	217
8	23	38	53	68	83	98	113	128	143	158	173	188	203	218
9	24	39	54	69	84	99	114	129	144	159	174	189	204	219
10	25	40	55	70	85	100	115	130	145	160	175	190	205	220
11	26	41	56	71	86	101	116	131	146	161	176	191	206	221
12	27	42	57	72	87	102	117	132	147	162	177	192	207	222
13	28	43	58	73	88	103	118	133	148	163	178	193	208	223
14	29	44	59	74	89	104	119	134	149	164	179	194	209	224
15	30	45	60	75	90	105	120	135	150	165	180	195	210	225

COST CUTTING IDEAS

250 261
251 262
252 263
253 264
254 265
255 266
256 267
257 268
258 269
259 270
260 271

301 313 325 337 349 361
302 314 326 338 350 362
303 315 327 339 351 363
304 316 328 340 352 364
305 317 329 341 353 365
306 318 330 342 354 366
307 319 331 343 355 367
308 320 332 344 356 368
309 321 333 345 357 369
310 322 334 346 358 370
311 323 335 347 359 371
312 324 336 348 360 372

401 413 425 437 449 461
402 414 426 438 450 462
403 415 427 439 451 463
404 416 428 440 452 464
405 417 429 441 453 465
406 418 430 442 454 466
407 419 431 443 455 467
408 420 432 444 456 468
409 421 433 445 457 469
410 422 434 446 458 470
411 423 435 447 459 471
412 424 436 448 460 472

Do you wish to continue to receive MATERIAL HANDLING ENGINEERING each month ☐ Yes ☐ No

Card Invalid Without Company Name

AUG. 1961 — Do not use after Nov. 15, 1961

NAME _____ TITLE _____

COMPANY _____ KIND OF BUSINESS _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

ADVERTISERS

1 16 31 46 61 76 91 106 121 136 151 166 181 196 211
2 17 32 47 62 77 92 107 122 137 152 167 182 197 212
3 18 33 48 63 78 93 108 123 138 153 168 183 198 213
4 19 34 49 64 79 94 109 124 139 154 169 184 199 214
5 20 35 50 65 80 95 110 125 140 155 170 185 200 215
6 21 36 51 66 81 96 111 126 141 156 171 186 201 216
7 22 37 52 67 82 97 112 127 142 157 172 187 202 217
8 23 38 53 68 83 98 113 128 143 158 173 188 203 218
9 24 39 54 69 84 99 114 129 144 159 174 189 204 219
10 25 40 55 70 85 100 115 130 145 160 175 190 205 220
11 26 41 56 71 86 101 116 131 146 161 176 191 206 221
12 27 42 57 72 87 102 117 132 147 162 177 192 207 222
13 28 43 58 73 88 103 118 133 148 163 178 193 208 223
14 29 44 59 74 89 104 119 134 149 164 179 194 209 224
15 30 45 60 75 90 105 120 135 150 165 180 195 210 225

COST CUTTING IDEAS

250 261
251 262
252 263
253 264
254 265
255 266
256 267
257 268
258 269
259 270
260 271

301 313 325 337 349 361
302 314 326 338 350 362
303 315 327 339 351 363
304 316 328 340 352 364
305 317 329 341 353 365
306 318 330 342 354 366
307 319 331 343 355 367
308 320 332 344 356 368
309 321 333 345 357 369
310 322 334 346 358 370
311 323 335 347 359 371
312 324 336 348 360 372

401 413 425 437 449 461
402 414 426 438 450 462
403 415 427 439 451 463
404 416 428 440 452 464
405 417 429 441 453 465
406 418 430 442 454 466
407 419 431 443 455 467
408 420 432 444 456 468
409 421 433 445 457 469
410 422 434 446 458 470
411 423 435 447 459 471
412 424 436 448 460 472

Do you wish to continue to receive MATERIAL HANDLING ENGINEERING each month ☐ Yes ☐ No

MHE IS NOW ADDRESSED LIKE THIS:

IT SHOULD BE CHANGED TO THIS:

MAJOR PRODUCTS MANUFACTURED OR TYPE OF BUSINESS AT THIS ADDRESS _____

MY JOB TITLE _____

SIGNATURE _____

Was this copy of MATERIAL HANDLING ENGINEERING correctly addressed? If not, use this card to give us your complete mailing address plus the old (incorrect) one.

FIRST CLASS
PERMIT NO. 8066
CLEVELAND, OHIO

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY MAIL

POSTAGE WILL BE PAID BY:

MATERIAL HANDLING ENGINEERING
812 Huron Road
Cleveland 15, Ohio

FIRST CLASS
PERMIT NO. 8066
CLEVELAND, OHIO

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY MAIL

POSTAGE WILL BE PAID BY.

MATERIAL HANDLING ENGINEERING
812 Huron Road
Cleveland 15, Ohio

FIRST CLASS
PERMIT NO. 8066
CLEVELAND, OHIO

NO POSTAGE STAMP NECESSARY IF MAILED IN UNITED STATES

BUSINESS REPLY MAIL

POSTAGE WILL BE PAID BY:

MATERIAL HANDLING ENGINEERING
812 Huron Road
Cleveland 15, Ohio

READER SERVICE CARD

Material Handling Engineering

FOR YOUR CONVENIENCE . . .

to receive further information about products described in this issue, circle the indicated number on the card.

BULLETINS CATALOGS FILMS

bales, loaded pallets. Also includes information on power-rotated crane hooks, coil buggies, powered furnace charging carriage, slab transfer cars.

Mansaver Industries, Inc.

Circle **411** on Reader Service Card

Light and Medium Duty Casters

Four-page bulletin summarizes line of light and medium duty casters (for loads to 500 lb. per wheel). Includes stem and top plate types, swiveling and rigid models, casters with side brakes. Specifications include dimensions, capacity, description of bearings.

Jarvis & Jarvis, Inc.

Circle **412** on Reader Service Card

Crawler Crane Technical Data

Comprehensive portfolios give you complete data on 3 new P & H crawler cranes (Models 525, 535, 550). Provide operating specifications, capacities, dimensions, crane range diagrams, and data on use of basic units for draglines, with clamshell buckets, shovels, hoes. Also explains electro-magnetic coupling to control swing drive, and enclosed oil bath for gearing. Important data in both metric and English units.

Harnischfeger Corp.

Circle **413** on Reader Service Card

Automatic Package Sorting

Automatic sorter handles 60 packages a minute. Folder demonstrates with case history that it enables 12 people to do sorting job that would require 140 using manual methods. Pictures other applications, and main components of the equipment.

Speaker Sortation Systems, Inc.

Circle **414** on Reader Service Card

Tow Line Conveyors

Perspective drawings, dimensioned architectural drawings, diagrams and photographs show clearly how subfloor tow-line conveyors are installed and operate. Bulletin TC-2 also explains overhead tow briefly.

Mechanical Handling Systems, Inc.

Circle **415** on Reader Service Card

Selecting Bucket Elevator Parts

If you know density of your bulk material, how much you want to move, how far, this bulletin tells you how to select the right chains, buckets, sprockets, bearings and takeups for a bucket elevator to handle it. Data in easily used tables. Bulletin 6057 includes pictures, specifications of each component, how to order.

Chain Belt Co.

Circle **416** on Reader Service Card

Vibratory Conveyors

Complete data on light, medium, and heavy tonnage vibratory mechanical conveyors given in 8-p. catalog. Illustrated with photographs, drawings.

Syntron Co.

Circle **417** on Reader Service Card

Automatic Weight Sensing

Eight-page manual shows how weight sensing works, and how it is used to sort, record weights, imprint weights, count, and to control production machines. Diagrams explain clearly how sensing equipment fits various operations. Also gives capacities, sensitivities of Shadowgraph weight sensors in the range 2,000 mg. to 100 lb.

Exact Weight Scale Co.

Circle **418** on Reader Service Card

High Capacity Fork Lifts

Bulletin 100A from Silent Hoist brings specifications for heavy duty fork-lift trucks, 5 to 12 tons capacity. Also presents features—power steering, fluid clutch, optional torque convertor drive and optional planetary axle. Sketches show dimensions, turning radii.

Silent Hoist and Crane Co.

Circle **419** on Reader Service Card

Precision Switches

Miniature switches, electronic switch-circuit assemblies, special purpose switches, limit switches, proximity and mercury switches among 200 items representing complete Micro Switch line in Catalog 104. Shows photos, gives information on contact arrangements, dimensions, mountings, electrical ratings.

Micro Switch Div., Minneapolis-Honeywell Regulator Co.

Circle **420** on Reader Service Card

Stingiest Gluing System

Air-pressure system for applying glue to cases does job so economically that it is called 'stingiest." How it works shown by drawings in 4-p. folder from Standard-Knapp. Includes specifications.

Emhart Mfg. Co.

Circle **421** on Reader Service Card

Elevating Conveyors

Six-page folder tells how Robo-Lift bucket elevator conveyors handle products as varied as small metal parts, sugar-coated chewing gum, cake mix. Lifts 60 ft. or more, saves floor space. Capacities 1.8 to 18 cfm.

Lynch Robo Corp.

Circle **422** on Reader Service Card

Overhead Doors, Operators

New model overhead door fits all clearance needs commonly found in industrial plants. Folder F-9381 includes electric operators made for heavy duty industrial use, safety controls.

OVERdoor Div., Barber-Coleman Co.

Circle **423** on Reader Service Card

Lift Truck and Attachments

Fourteen standard lift trucks, special models, and attachments such as clamps, rams, and extensions are shown in Catalog BU-660 from Allis-Chalmers. Includes power curves and specifications for each model from 2,000 lb. capacity to 10,000 lb. capacity.

Allis-Chalmers

Circle **424** on Reader Service Card

Prevention of Shipping Damage

Bulletin 716, sixteen pages, brings detailed product data and design information on shipping container mounting systems that protect against handling and shipping damage.

Lord Manufacturing Co.

Circle **425** on Reader Service Card

Weighs Material on Belt

Material in movement on belt conveyor can be weighed by pneumatic integrator. Totalizes and reads out

Continued on page 75

MORE ROOM AT THE TOP WITH MOTO-TRUC

Look up-- for more storage capacity!

Moto-Truc pays big dividends in extra storage space and top handling efficiency because Moto-Truc combines compact maneuverability with big-truck performance.

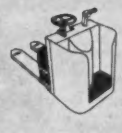
Moto-Truc's *Magic Circle* steering permits minimum aisle widths; ends caster whip, wobble and bucking . . . gives Moto-Truc stackers extra stability, that lets you stack to the ceiling with safety!

Moto-Truc finds more room at the top. Prove it on *your* own job!

The MOTO-TRUC Company

12403 TAFT AVENUE • CLEVELAND, OHIO

World's Largest Manufacturer of Small Rider Trucks



Circle **82** on Reader Service Card

BULLETINS CATALOGS FILMS

direct. Easily adjusted for belt weight. All pneumatic, no explosion hazard. Bulletin 550.20-2 explains operation, gives dimensions, air requirements.

B.I.F. Industries

Circle **426** on Reader Service Card

Side-Deck Platform Truck

Specification sheet F-40A-4 for 2-ton capacity powered platform truck. Clear area of platform extends from front to rear, so truck can carry long bar stock, pipe, tubing, etc. Sheet includes dimensional data.

Prime-Mover Co.

Circle **427** on Reader Service Card

Ways to Cut Costs

"18 Ways to Reduce Handling Cost" suggests specific applications of conveying equipment which save. Sample: High-angle (72°) elevating conveyor to save floor space. Each idea illustrated, in 4-p. bulletin.

Rapids-Standard Co.

Circle **428** on Reader Service Card

Compact Electric Truck

Bulletin 3000 emphasizes short turning radius, speed in both travel and lift of Scot M-3 electric fork lift truck. This model has 3,000 lb. capacity at 24-in. center, turns on 52-in. outside radius. With standard 83-in. (lowered) mast it lifts to 130 in. Uses 32 or 36 v. batteries.

James Campbell Smith, Inc.

Circle **429** on Reader Service Card

Specifications

"Recommended Minimum Standard Specifications for Electric Chain Hoists" defines terms used in describing hoists, sets standards for design and construction. Also lists data which should be in an inquiry addressed to a hoist manufacturer.

Hoist Manufacturers Association, Inc.

Circle **430** on Reader Service Card

Moves Lumber, Pipe, Logs

If you want to lift 5 tons of stacked planks off a flat car, working from one side and at one pass, Bulletin DLI-161 shows how to do it with a Lull Dyna-Lugger. Also handles logs, pipe, can pick one log from a pile because extensible lifting arm and its finger grab answer precisely to controls.

Lull Engineering Co., Inc.

Circle **431** on Reader Service Card

Tells All About Wire Rope

Of the 188 pages in Catalog G-16, MacWhyte devotes over 100 to information about selecting, using, maintaining wire rope products. Rest of book gives description and specifications for rope, cable, slings, fittings. A useful reference work for all who buy or take care of these products.

MacWhyte Wire Rope Co.

Circle **432** on Reader Service Card

Some Important Bulletins Featured in Advertisements in This Issue

Fork Truck Attachments

Rotating roll clamps for handling paper; drum attachments with case hardened gripper jaws; and carton attachments with case hardened rectangular slide bars are described in literature on their complete line. *Little Giant Products, Inc.*

Circle **140** on Reader Service Card

Monorail and Crane Information

"Cost-Cutting With Monorail and Cranes" is a 52-pg. illustrated industry application booklet offered by — *The Louden Machinery Co.*

Circle **70** on Reader Service Card

Booklet on Walkie Trucks

"Transporter Facts and Factors" and "AUTOMATIC Industrial Trucks Selector Guide" are two booklets offered by — *Automatic Transportation Co.*

Circle **7** on Reader Service Card

Dock Planning Booklet

A "Profitable Dock Planning Kit" is offered which includes dock layout recommendations; aisle, canopy, driveway requirements, and current trailer restrictions. — *Kelley Co. Inc.*

Circle **67** on Reader Service Card

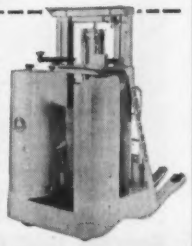
Tire and Wheel Analysis

Information on a free tire and wheel analysis plan is offered by — *The B.F.Goodrich Co.*

Circle **53** on Reader Service Card

Continued on Page 76

Counterbalanced fork truck handles variety of pallets or skids, requires no outriggers. Available with or without telescoping mast in capacities up to 3000 lbs., lifts up to 130".

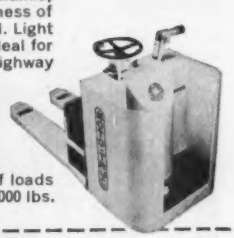


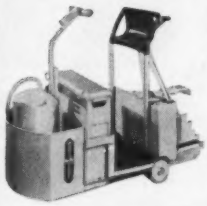
Outrigger type Hi-Lift fork truck for extra stability. Four-wheel support, Magic Circle steering, available in three models for any handling application. Capacities up to 4000 lbs., lifts up to 152".

MOTO-TRUC

Small Rider Trucks

Pallet truck has compactness of a walkie, ruggedness of a rider model. Light weight is ideal for loading highway trucks. Wheel steering, foot brake, dead man control. For horizontal movement of loads up to 4000 lbs.





Tractors feature unique design permitting operation from walking or riding position. Small, maneuverable, all safety features. Develop up to 750 lbs. draw bar pull.

Write for Moto-Truc's free Ride-A-Man catalog — Bulletin No. 56-R.

World's Largest Manufacturer of Small-Rider Trucks

The MOTO-TRUC Company

12403 Taft Avenue • Cleveland, Ohio

Circle **83** on Reader Service Card

Circle **110** on Reader Service Card

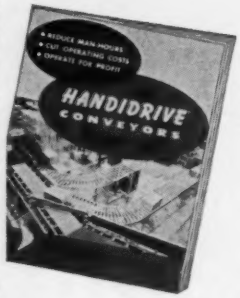
Save up to ⅓ the cost of your next conveyor!

(FREE HANDBOOK SHOWS HOW)

Handidrive Conveyor Handbook shows how fast and easy you can install your next conveyor . . . how you can save up to ⅓ the conventional cost with "off-the-shelf" ordering and "do-it-yourself" planning and installation.

Describes roller conveyors (both gravity and power), belt conveyors, drive units, intermediate sections, curved sections, supports, hangers, and other needed items . . . all in stock to fill your order fast.

Send today for this valuable new Handbook. No obligation.



Standard Conveyor

302-H Second Street, North St. Paul, Minnesota

Circle **120** on Reader Service Card

BULLETINS CATALOGS FILMS

Plan Conveyor System Yourself

In Bulletin 112 you find information you need to plan conveyor system, using belt or roller conveyors. Covers dimensions, capacities, drives. Gives examples to explain how to calculate needs. Includes accessories such as motors, controls, sprockets, supports.

Standard Conveyor Co.

Circle **433** on Reader Service Card

Modular Work Stations

Develop your layout, select modular elements from a catalog, put them together to get a custom-tailored production line with work stations exactly as you need them. Basic elements are legs, frame struts, bench tops, and to fit them there are bins, shelves, drawers, lights, conveyors, etc. Bulletin 159 shows how.

Products for Industry, Inc.

Circle **434** on Reader Service Card

Towing Tractor

The 4,000-lb. drawbar pull of a new towing tractor eases loads into motion smoothly, because truck has torque convertor drive. Folder A-92 explains the drive, furnishes dimensions and specifications on tractor.

Mobilift Div., Motec Industries, Inc.

Circle **435** on Reader Service Card

Tubar

MODEL TC-3 HEAVY-DUTY, 3-TON TUBAR CRANE

FLOOR CRANES

8 MODELS 1/2 TO 3 TONS

Tubar Cranes have *QUALITY* where it counts...

- Tilt-Back Mast . . . greater space for load under the boom
- Built-in extension boom . . . no extras to buy
- Variable-Stroke Hydraulic Pump . . . operator adjusts pumping effort to suit load
- Needle-type Control Valve . . . regulates lowering speed for maximum safety
- Overload By-pass . . . safety valve activated automatically by overloads
- Roller Bearing Wheels and Casters
- Four-Point Suspension . . . safe, maneuverable

USE TUBAR FLOOR CRANES FOR . . .

AUTOMOTIVE — Handling engines and transmissions. Hoisting chassis units for repairs.

INDUSTRIAL — Warehousing and truck cargos. Machine installation—heavy part assembly.

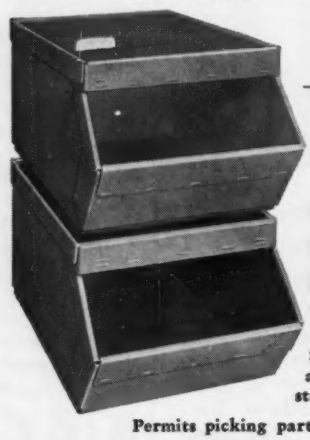
There's a TUBAR Man Near You . . . write to:

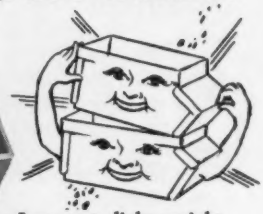
UHRDEN INC., DENNISON, OHIO

U-361-185-A

Circle **120** on Reader Service Card

I'm a **DOUBLE DUTY DANDY!**





Low cost, light weight

HOPPER-FRONT SELF-STACKING TOTE BOXES

Strong shoulders front and back allow positive stacking without shelving.

Permits picking parts without disturbing stack.

YET each box can be used as a TOTE if desired.

Ideal multi-use in processing, storing, assembly. Made of "Chem-Board," our chemically rigidized extra heavy corrugated board. Stock No. J-91 shown is 16" wide, 18" long, 10" deep. 5 other stock sizes made.

CONVOY, INC.

P. O. Station B, Box 216-F
CANTON 6, OHIO

GReenwood 7-4569

Circle **29** on Reader Service Card

Tough Toters

Twice as light as aluminum, as strong as iron, is the description given vulcanized fiber in 4-p. bulletin on tote boxes, trays, tub trucks made of this material. Illustrates 15 standard designs.

National Vulcanized Fibre Co.

Circle **436** on Reader Service Card

Automatic De-Palletizer

Sequence of clear 3-dimension drawings in Folder F-225 shows how de-palletizer works. Unstacks cases from pallets, sends them off on run-off conveyor at 45 a minute. Adjusts to many carton sizes, most stacking patterns. Folder pictures electric and hydraulic controls, diagrams l.h. and r.h. layouts.

Alvey Conveyor Mfg. Co.

Circle **437** on Reader Service Card

Servicing Lift Trucks

When you have a lot of lift trucks using LP Gas, it's cheaper to take the fuel to them than to have them run to the fueling point. That's the gist of "Dry Land Tanker," a case history describing use of a load carrier to haul fuel, oil, and water to a fleet of 70 lift trucks. Shows pictures of operation, gives costs.

Kalamazoo Mfg. Co.

Circle **438** on Reader Service Card

Staplers, New Clip Clincher

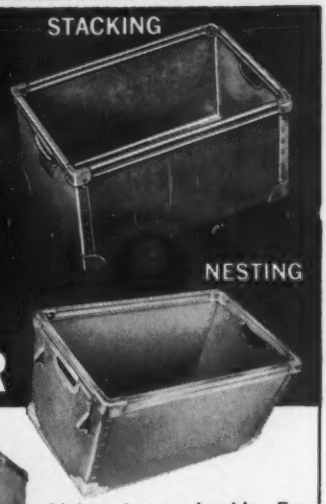
New item in catalog of industrial staplers is air-powered clip clinching tool: it puts clip around wires. Also covers

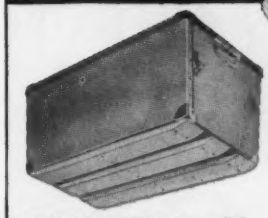
Continued on page 78

Circle **47** on Reader Service Card

Fedco

FIBRE BOXES
TOTE
MILL
STOCK
CONVEYOR





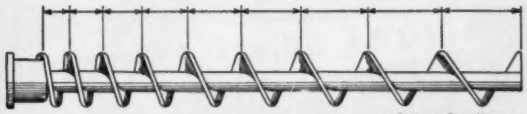
CONVEYOR BOX with solid hardwood or runners on bottom for all types of conveyor systems.

Light, strong, durable. Expertly constructed for heavy duty. Body and bottom of superior grade fibre. For moving, storing or assembling small parts and materials. Made in sizes to your requirements.

Also a complete line of FEDCO Fibre Box Trucks and FIBEROK Disposal Cans. Write for Catalog.

Federal FIBRE CORPORATION
2626 Fourth Street, Dept. 7, Long Island City 2, N. Y.

Now! A Screw that Prevents PACKING



Patent Pending

Progressive Pitch Conveyor Screw

With this uniquely designed and constructed screw, material can be conveyed *without packing!* Each pitch is progressively larger so the material is moved forward at a greater speed per revolution and won't bind or clog.

The PROGRESSIVE PITCH CONVEYOR SCREW can be produced for the handling of any material using a spiral shaft conveyor. It can be made in any pitch, diameter and capacity, with right or lefthand flights, to your specifications. 10,000 different combinations of pitches, diameters and sizes are possible. Some standard sizes in stock in different cities.

Install a PROGRESSIVE PITCH CONVEYOR SCREW to replace an old one or to use in your new systems.

NEW FOLDER THAT TELLS ALL—SEND FOR IT TODAY!

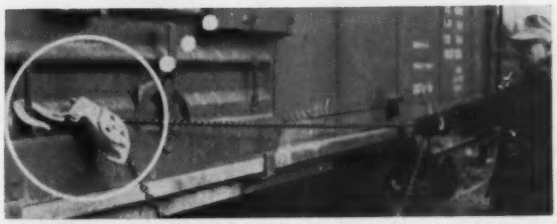
Call or write so we may discuss your conveyor needs or problems.

WORLEY EQUIPMENT, INC.
2301 N. Knox Avenue • Phone ALbany 2-2830
CHICAGO 39, ILL.

Circle **130** on Reader Service Card

END THIS COSTLY MAN-KILLING PRACTICE!

— save lives, limbs and money with the



NOLAN MODEL H ONE MAN CAR DOOR OPENER

Opens any freight car door in 20 seconds or less! ONLY $45 f.o.b. Bowerston.

Write for complete new catalog

The Nolan Co., 110 Pennsylvania St., Bowerston, Ohio

Circle **89** on Reader Service Card

Circle 15 on Reader Service Card

MAKE EFFICIENT SYSTEMS
from BUSCHMAN IN-STOCK units

Buschman standardized portable conveyors save far more than they cost, handling all kinds of packages, in large and small operations. Select wheel, roller, belt components from stock, to install your own conveyor line. Or build your own Overhead Trolley Cable Conveyor from Buschman standardized units. Consult our agent or write direct.

Complete Conveyor Systems for all Industries—Engineered, Manufactured-Installed
Representatives in Principal Cities; See Yellow Pages

Buschman
CONVEYORS

371

The E. W. Buschman Company, 4450 Clifton Avenue, Cincinnati 32, Ohio

BULLETINS CATALOGS FILMS

air- and hand-operated staplers, tackers, stapling hammers, stapling pliers. Photos show tools in use.

Signode Steel Strapping Co.

Circle 439 on Reader Service Card

Screw Surface of Cable Conveys

Rotating cable with screw surface is the drive for Monoflo conveyors. May be used in overhead-rail installations, or as drive for wheel conveyors, chutes. Speeds to 15 ft. a minute, handles weights up to 25 lb. Booklet describes construction, uses.

M-H Standard Corp.

Circle 440 on Reader Service Card

Compact Lift Trucks

Low masts, ability to maneuver in cramped quarters are features of "compact" fork lift trucks. Capacities are 3,000, 4,000, and 5,000 lb. Bulletins describe 2 series: Model with single range automatic transmission, 8½ m.p.h. speed, covered in Bulletin 5279. Slightly larger truck with 2 speed range transmission, 12½ m.p.h. top speed, in Bulletin 5287. Photos, diagrams, specifications, full data on dimensions and maneuver-space in both bulletins.

Yale & Towne Mfg. Co.

Circle 441 on Reader Service Card

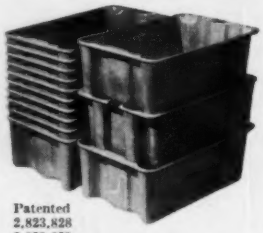
Continued on page 80

LEWIS TOTE PANS

are

STRONG

One-piece fiberglass molded construction; can't rust, rot, dent or bend. Stack-n-Nest® pans handle up to 3000 lbs. safe static load. Available in 8 sizes, three attractive molded-in colors.



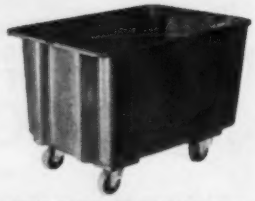
Patented
2,823,828
2,823,829

LIGHTWEIGHT

Lighter than an aluminum pan of the same size, these general purpose Lewis fiberglass pans handle bigger payloads with less effort.

. . . versatile

This Stack-n-Nest® truck is only one of the many different Lewis containers, each designed for a variety of handling operations. There are trays, pans, boxes, and trucks to fit all your handling requirements.



SEND FOR THE BIG LEWIS CONTAINER CATALOG TODAY

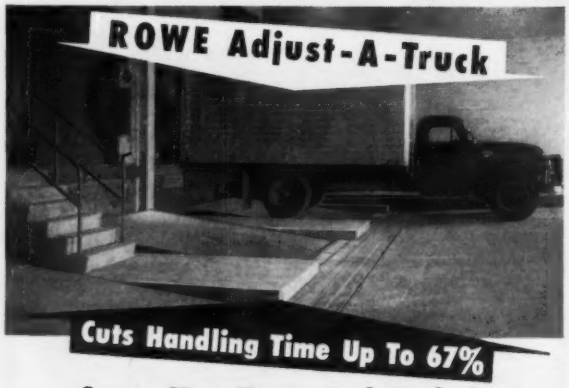
G. B. Lewis COMPANY

Shipment within 24 hours from receipt of order

608 MONTGOMERY STREET • WATERTOWN, WIS.

Circle 69 on Reader Service Card

Move Greater Pay Loads . . .
Faster, Safer With Money Saving



. . . Saves Man Hours And Dock Space

■ Here's the low cost answer to positioning any highway carrier to proper dock height when it is impossible to use dock leveling ramps because of construction or space limitation. This 40,000 lb.-capacity hydraulic truck leveling device has 24" up-down travel and features: Low Initial, Installation and Operating Cost • Short Amortization Period • Rugged Construction for Long-Life Service • Minimum Maintenance • Exceptional Ease of Operation.

Write for our new folder—It's free of course

Planning service available without cost or obligation.

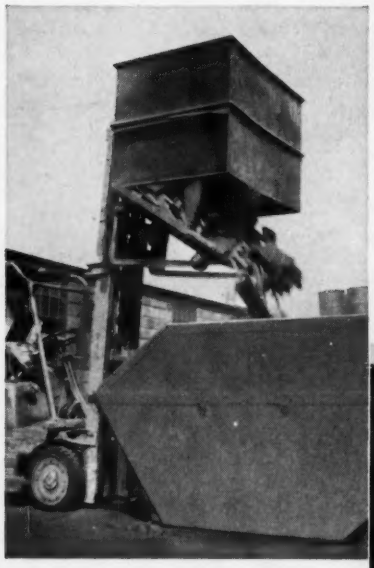
ROWE METHODS, INC.

2534-C Detroit Avenue • Cleveland 13, Ohio

Circle 100 on Reader Service Card

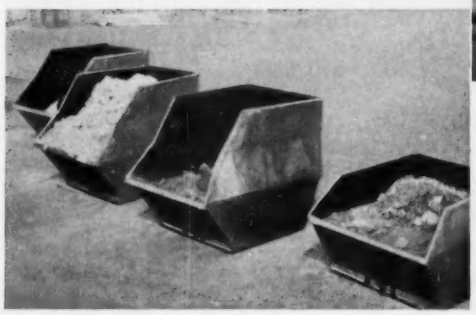
HEIL LOAD LUGGER®

saves waiting time, double handling of waste at Johns-Manville plant...



Improved Housekeeping — Scrap and waste generated from the manufacture of Rock Wool insulation formerly was dumped into an open pit . . . and then loaded into trucks. Now it's dumped directly into a LOAD LUGGER detachable container. When filled, container is picked up automatically by a LOAD LUGGER truck . . . hauled to dump and returned. Plant area is always neat and clean. Good housekeeping, with refuse collected in container, also contributes to safety.

No Double Handling — Here a filled container is about to be picked up by the LOAD LUGGER. Driver simply attaches hoist chains and automatically lifts container aboard. No waiting to be loaded by a clamshell — no tying up equipment and man power — no double handling of waste.



Highly Flexible Operation — The 17 containers of various sizes and types are spotted in strategic positions on a two-acre rectangle around production building of Johns-Manville's Alexandria plant. They are easily loaded by cart, conveyor, front-end loader or clamshell. Picture shows an inplant trucker dumping a two-yard container into a six-yard LOAD LUGGER container.

•

LOAD LUGGER *Systems are available for all types of industries — containers up to 16-cu-yd capacities — open- and closed-type. Write for name of your nearest dealer — get the cost-cutting story now.*

One Truck, One Driver reduces truck and labor costs. LOAD LUGGER at disposal grounds dumps contents cleanly and quickly . . . returns empty and picks up another loaded container. Repeats process all day — never any waiting. Result: more efficiency . . . lower disposal costs because a single truck and one driver does the work of many. Besides waste, LOAD LUGGER System also handles raw materials such as slag and coke.

THE HEIL CO.
MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis. • Hillside, N. J.; Lancaster, Pa.; Cleveland, Ohio; Modesto, Calif.

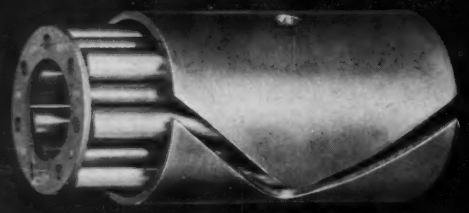
LOAD LUGGER and HUGE HAUL SYSTEMS

Sales Offices: Hillside, N. J.; Washington, D. C.; Atlanta, Ga.; Cleveland, Ohio; Chicago, Ill.; Milwaukee, Wis.; Kansas City, Mo.; Denver, Colo.; Dallas, Texas; Los Angeles, Calif.; Seattle, Wash.

Circle 57 on Reader Service Card

Circle 31 on Reader Service Card

CORLETT-TURNER
The QUALITY Bearing
in the 90,000 Series



unexcelled < MATERIALS
CONSTRUCTION
FINISH
PERFORMANCE

C-T ROLLER BEARINGS

provide maximum service life at lowest possible cost. Widely used by major material handling, caster, wheel and farm equipment manufacturers. *Write for Catalog and Specification sheets today.*

CT

CORLETT-TURNER CO.
9161 King Street • Franklin Park, Illinois
"BUILDING A REPUTATION ON SERVICE"

BELT
CONVEYORS

Pre-engineered horizontal, floor-to-floor or ceiling-hung conveyors . . . rugged construction with oversized shafting, precision sealed-for-life bearings, crown face steel pulleys. Three standard belt widths 14", 18" and 24". Assembled from stock components for prompt shipment. Can be connected with Olson wheel and roller conveyors to make a complete conveyor system. Write for Cat. 1351.

OLSON CONVEYORS

MANUFACTURED BY
SAMUEL OLSON MFG. CO., INC.
2426 Bloomingdale Avenue • Chicago 47, Illinois
DIVISION OF CHERRY-BURRELL CORPORATION

Circle 94 on Reader Service Card

BULLETINS CATALOGS FILMS

Storage Planning Guide

Sixteen-page booklet outlines 12 principles to follow for better storage. Explains how you can set up adjustable racks from 3 standard parts. Shows pictures of installations. Includes questionnaire you can fill out, to get maker's assistance in planning, and estimates.

Union Asbestos & Rubber Co.

Circle 442 on Reader Service Card

Exhaust Fume Report

"Exhaust Products from Gasoline-Powered Lift Trucks" reports tests made by Franklin Institute. Describes tests briefly, presents conclusions: recommends both ample ventilation and conversion of exhaust fumes to harmless products.

Oxy-Catalyst, Inc.

Circle 443 on Reader Service Card

Carriers for Troughed Belts

Troughing carriers for conveyor belts handling all kinds of bulk materials. Bulletin 760 explains construction with cutaway drawings, includes specifications, dimensional drawings. Also shows return rollers, guide rolls and automatic belt training (alinement) carriers.

Stephens-Adamson Mfg. Co.

Circle 444 on Reader Service Card

Conveyor Catalog

With many large, clear pictures Catalog 70 brings you a wealth of information about conveyors. Includes trolley, roller, slat, chain, and belt types, portable and standard units, and custom-engineered systems. Photos and drawings show attachments, details of construction, and fixtures.

Conveyor Systems Inc. and A. B. Farquhar Company

Circle 445 on Reader Service Card

Conveyor Chain Manual

Explains reasons for various designs of conveyor chains, gives charts for selection of chain, sprockets, and charts. Provides formulas for figuring pull on horizontal, inclined, and vertical conveyors. Offers tips on maintenance and trouble-shooting.

Moline Malleable Iron Co.

Circle 446 on Reader Service Card

Carrier Power Doubled

New motors and transmissions double drawbar pull of gasoline-powered personnel and goods carriers. One cylinder model rated at 9 h.p., two-cylinder at 18 h.p. Eight-page folder T-102 explains new mechanical features—motors, electrical system, transmission, clutch, auxiliary transmission. Specifications for both gasoline and electric powered models.

Cushman Motors

Circle 447 on Reader Service Card

S.R.T.* licks the major causes of tire failure!

NEW STEEL ARMOR DISCOURAGES CUTS, BRUISES, PUNCTURES—U.S. ROYAL GRIP-MATIC S.R.T.

The SRT*—*S*teel-*R*einforced *T*read and Sidewall—in U.S. Royal Grip-Matic Tires provides the toughest industrial pneumatic ever!

As you can see, a thick layer of rubber containing thousands of short steel filaments forms a virtually impenetrable mat that guards tread and sidewall against cuts, ruptures and penetrations. You enjoy less tire repair, less vehicle downtime, increased tire life. And you get better traction, too, for the U.S. Royal Grip-Matic gives you sure grip on slick ramps and yard areas!

Don't forget to specify "U.S. ROYAL" on your new equipment.

U.S. ROYAL SAFETY 1st TIRES

United States Rubber

Rockefeller Center, New York 20, N.Y.

Mr. W. J. Shalley
Industrial Tire Dept., U.S. Rubber
Rockefeller Center, New York 20, N. Y.

Please rush me your complete industrial tire manual.

Name_____

Address_____

City & State_____

Circle 119 on Reader Service Card

Choice of the wise buyer who compares...

CM HOISTS

CM METEOR ELECTRIC WIRE ROPE HOIST ½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control. Hook suspension; plain, geared or motor driven trolley.

CM LODESTAR ELECTRIC CHAIN HOIST—⅛ to 2 ton capacities—First truly heavy duty version of small electric hoist. ¼ ton model weighs only 51 lbs. Heavy duty self-adjusting brake, plus exclusive regenerative electrical braking. Upper-lower safety limit switches. CM-Alloy load chain. Single and three phase.

HAND OR ELECTRIC CHAIN OR WIRE ROPE

CM makes them all! So you can choose a hoist that's perfectly suited to your specific needs in a compact, rugged and safe CM design.

CM TROLLEYS AND CRANES

CM CYCLONE Hand Chain Hoist—¼ to 10 ton capacities—Easy to carry. One ton model weighs only 36 pounds. Made of tough aluminum alloy. CM-Alloy load chain. High efficiency. Lifetime lubrication.

CM PULLER—"The One Man Gang"—¾ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation Automatic load brake holds at any point. ¾ ton model weighs only 13 pounds and fits in a tool box. CM-Alloy load chain.

● **FOR OVER 75 YEARS,** Chisholm-Moore has offered hoist buyers the newest and most efficient designs, the most rugged construction, and the greatest number of valuable operating and safety features. CM hoists operate with a very minimum of maintenance. They give years of satisfying service.

Request catalog and name of local stocking distributor.

CM HOISTS

CHISHOLM-MOORE HOIST DIVISION
COLUMBUS McKINNON CORPORATION
TONAWANDA, NEW YORK
NEW YORK (Mountainside, N.J.), CHICAGO, CLEVELAND, SAN FRANCISCO
In Canada: COLUMBUS McKINNON LIMITED, ST. CATHARINES, ONTARIO

Circle **26** on Reader Service Card

PRODUCT NEWS

Continued from page 43

Turnover Conveyor Belt

System allows the belts to twist themselves automatically, reversing the top and bottom surfaces after

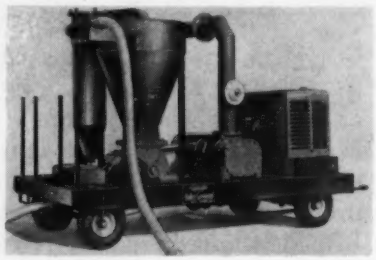
delivering and before taking a new load. This positions the clean side of the belt on top of the return idlers, prevents build-up of tacky materials on the idlers or pulleys. The twist pulleys are at each end of the belt flight. Each turns the belt 180 degrees. The thick carrying cover of the belt is always in position to receive a load. System can be applied to any conventional conveyor system without altering the conveyor framework. You only have to have necessary space for mounting turnover pulleys and accommodating the belt turn. Ideal for handling moist or wet materials such as iron, limestone, or wet sand. And wet material can be handled at low temperatures with no danger of the belt freezing to pulleys and idlers.

Industrial Products Co., B.F.Goodrich

Circle **320** on Reader Service Card

Big Capacity, Small Unit

Versatile Airveyor transfers pneumatically whole grains, seeds, beans, and other granular material. Combines maximum capacity and portability. Uses a combination vacuum unloading, pressure delivery system. The unit propels a dense stream of material through relatively small

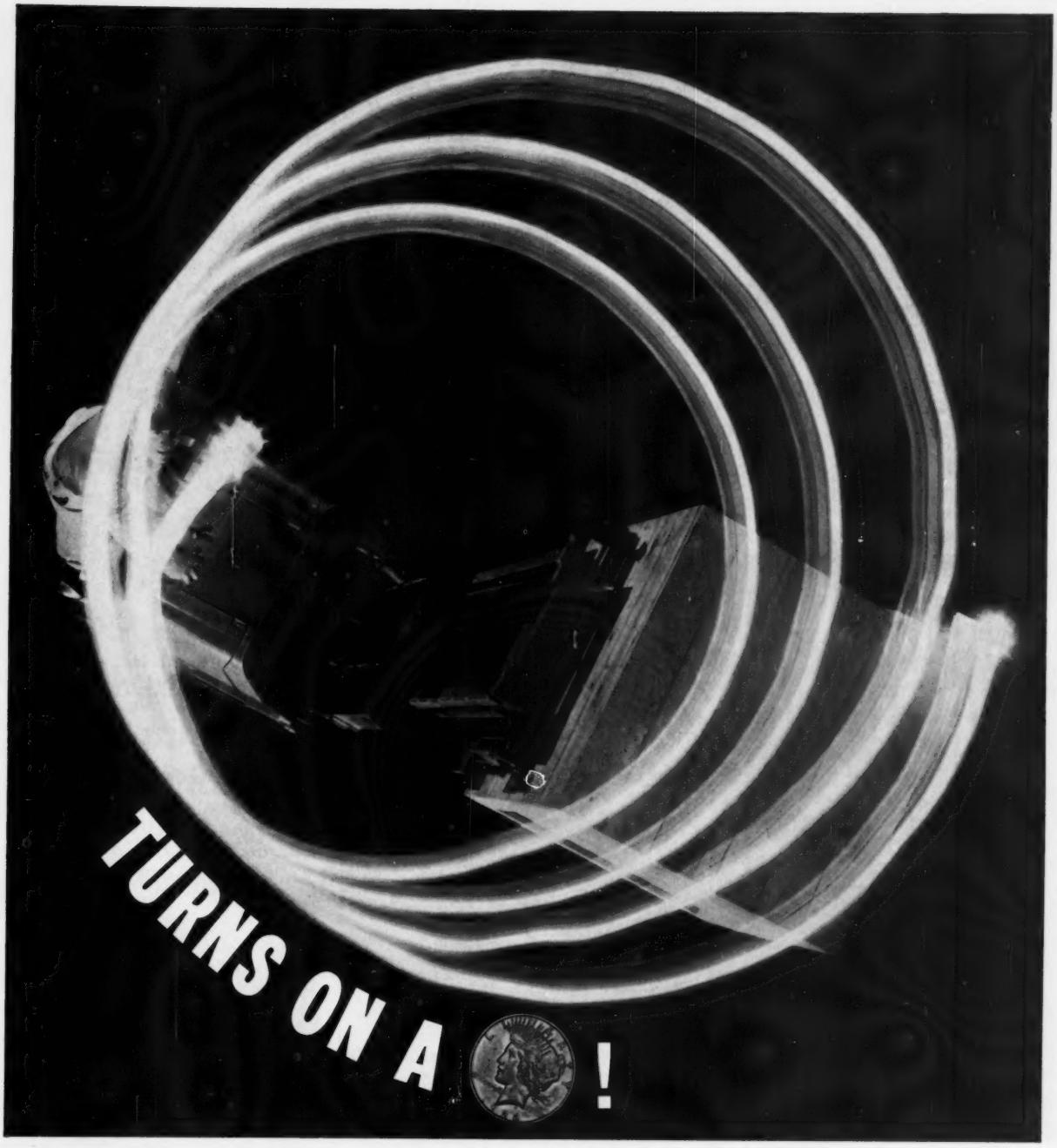


ducts. Transfers in either direction between silo and truck, rail car, or warehouse. Also, between truck and railcar, between ship and shore. Comes assembled, ready for use at the job site.

Fuller Company

Circle **321** on Reader Service Card

Continued on page 84

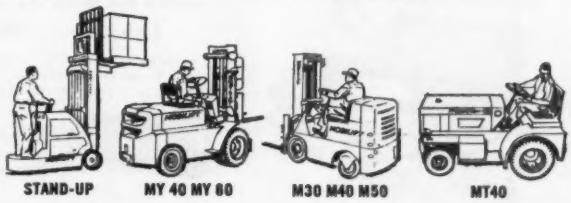


Mobilift's exclusive Stand-Up Truck pivots in 55 inches, threads 3 foot aisles . . . solves crowded warehouse problems. Stand-Up Trucks are as small as 33″ wide and 64″ long, less forks. They have zero inside turning radius. They can corner in just 52″, turn around in just 9 feet, thread aisles only 35″ wide. Yet they can lift 2000 to 3500 lbs. as high as 17 feet, depending on model.

A man can learn to operate a Stand-Up in one day. And he's mobile and safe; he can get on or off in a step.

The Stand-Up Truck gives you all these cost-saving advantages—plus unique Lev-R-Matic transmission and high free lift. *Yet it costs less than any other gas-operated truck.* Whether it's a sit-down or a stand-up truck you need, we can solve your handling problem efficiently and inexpensively.

For full information at no obligation write today. Distributed by John Morrell Manufacturing Co., a subsidiary of MOTEC INDUSTRIES, *Hopkins, Minn.*



MOBILIFT MOTEC

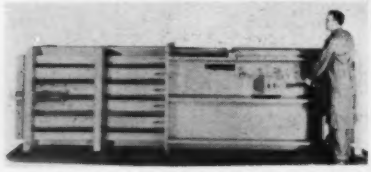
Materials Handling Equipment Division of MOTEC INDUSTRIES

Circle 81 on Reader Service Card

PRODUCT NEWS

Baler With Four Features

Useful for box manufacturing, paper finishing, and printing plants, and in department stores. It's 72



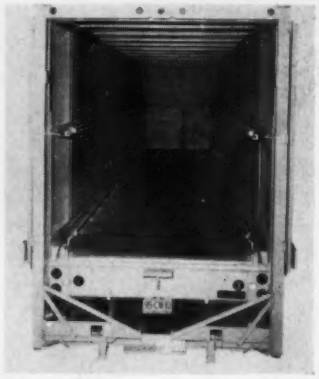
inches long, 42 inches high, 30 inches wide, turns out a mill-size bale. Paper, chipboard, or boxboard bale weighs 1,200 lb.; corrugated bale, from 900 to 1,000 lb. Four features: 1) Portability, no pit or special foundation needed; 2) Speed, ram makes complete stroke cycle in 24 seconds; 3) Convenience, hopper holding 21 cu. ft. stands 50 inches above the floor on top center of the baler; 4) Safety, all moving parts encased for worker protection. This baler, largest of a line of five, can be made to work automatically with extra equipment.

Lake Engineering Co.

Circle **322** on Reader Service Card

Mechanize Your Trailers

Load and unload trailers faster with the Relae system. Build up loads on forms that slide into a trailer on builtin wheeled tracks. Hydraulically-operated arms on rear of trailer lift loads to proper level for trailer tracks. Photo shows two sets of tracks. You move the arms by battery, engine, or outside power source. The loaded



forms can take wheels and legs for hauling away from trailer during unloading. You can get a chute that sets up the loaded forms for trailer loading in one quick operation.

Kappen Sales Co.

Circle **323** on Reader Service Card

COMPACT IN SIZE
COMPACT IN PRICE
BIG IN WORK ABILITY

AMERICAN'S new, compact lightweight one-ton capacity Lift is the answer to thousands of material handling jobs -such as found in the Graphic Arts, Paper & Converting, Food Processing, Warehousing, Metalworking and Furniture industries.

$595.00 F.O.B. Tacoma, Wash.

Complete, ready to operate - Just plug into ordinary 110 V circuit. Shipping weight 360#. Immediate delivery

- 2000# capacity • 36" travel • 6" lowered height
- 42" extended height • Up-travel time — 35 seconds
- Down-travel time — 10 seconds • ½ HP pump unit
- Foot controls • 10' of electrical cord supplied
- Offered in platform sizes 18" x 42" and 24" x 48".

SAME Lift with phenolic roller bearing wheels and two-wheel jack handle.

f.o.b. Tacoma $695.00

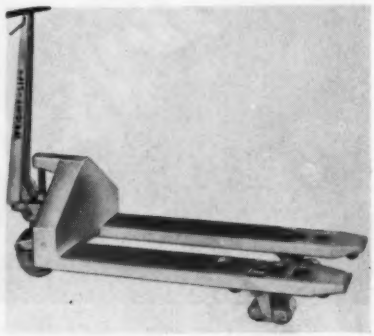
Lowered height — 6½" Shipping weight — 400#
Prices subject to change without notice.

American MANUFACTURING COMPANY INC.
2119 Pacific Ave. Tacoma, 2 Washington, USA

Circle 9 on Reader Service Card

Features Gentle Lowering

Hand throttle enables you to lower load gently on 6,000-lb.-capacity pallet truck with HLC (hand lower-

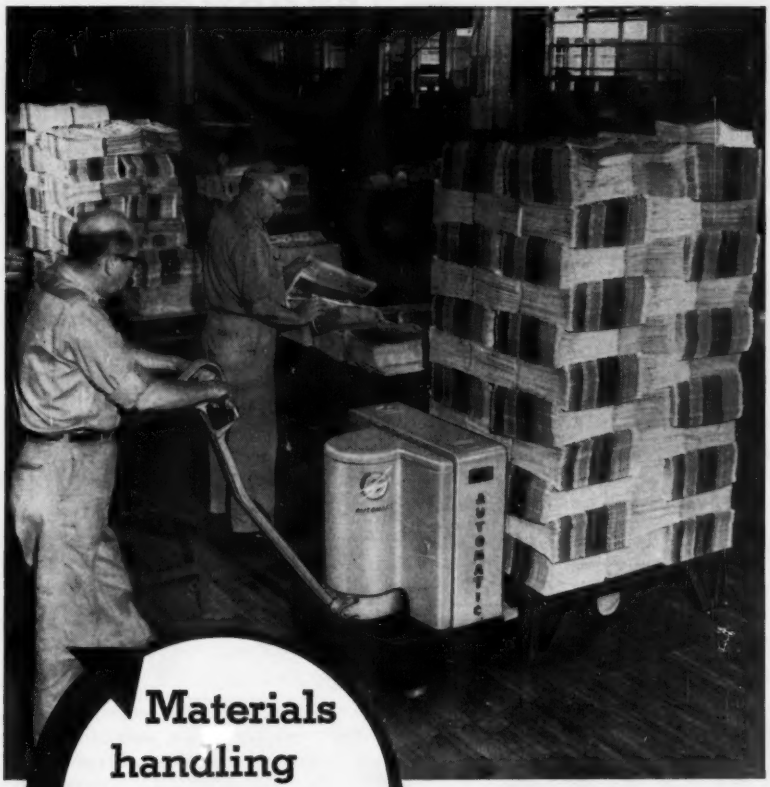


ing control). Gives uniform control feel, regardless of pumping handle position. Handle controls lifting, lowering, pushing, pulling, and steering. Will lower while in motion. Includes quick load drop to avoid collision, runaway, and injury to worker. Hand truck features tandem load wheels. Also, a pump unit, a casting, with machined oil passages, overload relief valve, overflow valve, magnetic oil filter, honed cylinders, and hard chrome-plated pistons.

Wright Hibbard Industrial Truck Co.

Circle **324** on Reader Service Card

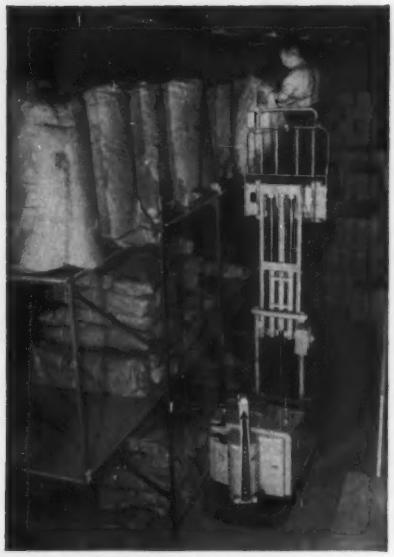
Continued on page 86



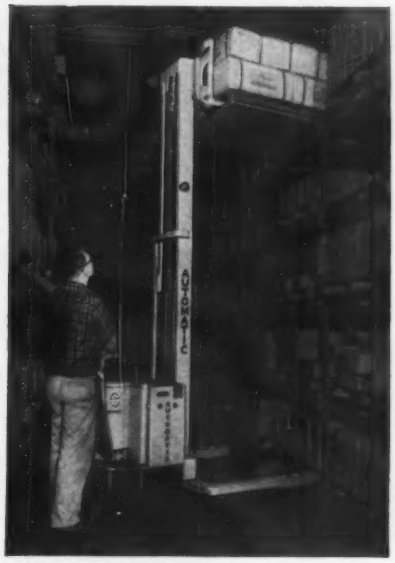
Materials handling for only pennies a day!

AUTOMATIC® *Transporters do many jobs, cost surprisingly little*

Here's the economical way to put mechanical handling to work for you in cramped quarters or where distances are short. AUTOMATIC Transporters with finger-tip controls speed up operations and cut handling costs. You get these advantages at an initial cost far less than rider-type trucks. Operating costs are lower, too. Just pennies a day buys the power for these rugged machines. With over 75 different walkie models in the AUTOMATIC line, there's a Transporter to fit every job.



Cantilever - type Transporter - Stacker with remote control mast and special platform expedites selection of orders. Truck also can be used for conventional stacking. Model WST capacities 1,000 through 4,000 lbs.



Model WAT Transporter stacks pallets in narrow aisles. Load is carried on forks between outrigger arms which provide safe stability during stacking operations. Capacities from 2,000 through 20,000 lbs.

AUTOMATIC

AUTOMATIC TRANSPORTATION COMPANY
Division of The Yale & Towne Manufacturing Company
141 West 87th Street, Dept. M1, Chicago 20, Ill.

FIRST IN IMAGINATION
FIRST WITH REALITY

SEND FOR DESCRIPTIVE LITERATURE

Get all the facts about AUTOMATIC's 75 Walkie models. Write for "Transporter Facts and Factors" booklet and "AUTOMATIC Industrial Trucks Selector Guide."

Name_____

Company_____

Street_____

City_____ Zone_____ State_____

Circle 7 on Reader Service Card

Circle 13 on Reader Service Card

IT'S FAST
IT'S ECONOMICAL
IT'S PORTABLE

BAUGHMAN MODEL Q-51
SCREW CONVEYOR

This maneuverable screw conveyor by Baughman moves 25% more volume of materials that roll or become fluid in motion. No rollback. 9" screw actually pumps material through round casting. Available in lengths from 10' to 50', with electric or gasoline motor. 50' model can be elevated to height of 26'. Also available in stationary models. Optional accessories include detachable hopper with legs, and undertrack unloader.

For Complete Information Write for Bulletin A-405

A few choice distributorships available

BAUGHMAN MANUFACTURING CO., INC.

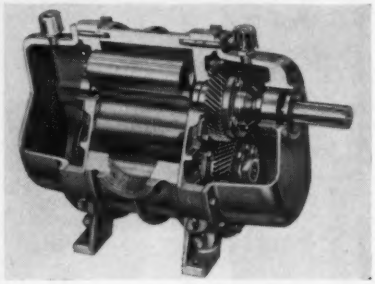
315 SHIPMAN RD. • JERSEYVILLE, ILLINOIS

6134

PRODUCT NEWS

Pneumatic Conveying Blowers

New Series 16 Standard Duty Blowers combine the durability of heavy-duty cast iron models with the advantages of lighter weight and lower cost aluminum. Eleven models available, all designed for use in material handling systems requiring from 50 c.f.m. of air pressure up to 12 p.s.i. or up to 12" Hg. vacuum. Applications include loading and unloading of dry bulk cement, grains, flour, dry chemicals, and other products in granular or powdered form.

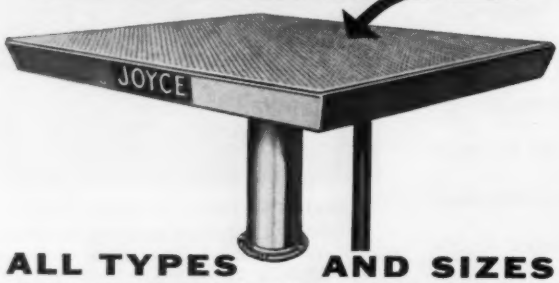


M-D Blowers, Inc.

Circle 325 on Reader Service Card

Continued on page 88

JOYCE MATERIALIFTS®
Speed Materials Handling!



ALL TYPES AND SIZES

Single and Two-Post Platform Lifts... Dock Handling Equipment... Factory Truck Service Lifts... Special Hydraulic Lifts... Hydraulic Cylinders—All Sizes... Compression Devices... Elevator Components... Custom Engineered Material Handling Products... SEND COUPON FOR NEW BULLETIN 441 TODAY!

THE JOYCE-CRIDLAND COMPANY, DAYTON 3, OHIO
Rush Bulletin 441 on MATERIALIFTS!

NAME _____

COMPANY _____

ADDRESS _____

Circle 65 on Reader Service Card

magcoa

THE OLDEST TRADENAME IN LIGHT METALS MATERIALS HANDLING PRODUCTS

MAGNESIUM DOCKBOARDS

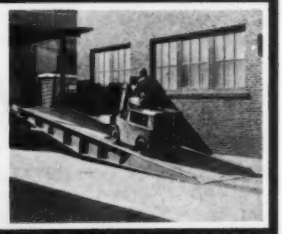
For safe, skid-proof truck and rail loading! Rugged but lightweight—one man can position. Engineered to fit your dock and equipment. Most modern economical dockboards available.

PALLET DOLLIES

Free your lift trucks—end loading bottlenecks! Magnesium—light and durable—at no premium. Magcoa rollers give total maneuverability. 18 standard sizes—capacities to 4000 lbs.

PORTABLE YARD RAMPS

Solve your ground level loading problems! 32 std. mobile models—capacities to 100,000 lbs. Engineered to accommodate all equipment, load and height requirements.



Write today!

MAGNESIUM COMPANY OF AMERICA
155 S. E. 10th Ave. TUxedo 7-8117 Hialeah, Florida

Circle 78 on Reader Service Card

another *American* "first" an innovation in

adjustable STORAGE RACKS

for sheet metal and other flat materials

Here's a rack that's a must for all warehouses that store flat sheet materials. By eliminating the full-length stringers (except at the top and bottom levels where they serve as tie bars), valuable space is saved, thereby providing more productive storage space in the same area. The material is stored on a special pallet made of rugged, continuous welded square tubing. The pallet is supported on short non-bolting cantilever arms that can easily and quickly be raised to any level, on SLIDE-N-LOCK posts (see inset). Each upright frame has 3 posts so that the special tubular pallet is supported at 6 places, assuring maximum stability and a greater safety factor. Another American money-saving, space-saving contribution to modern, efficient warehousing.

send today for catalog

Notice how the fork guides under the pallet occupy the space where the stringers would normally be.

AMERICAN METAL PRODUCTS COMPANY

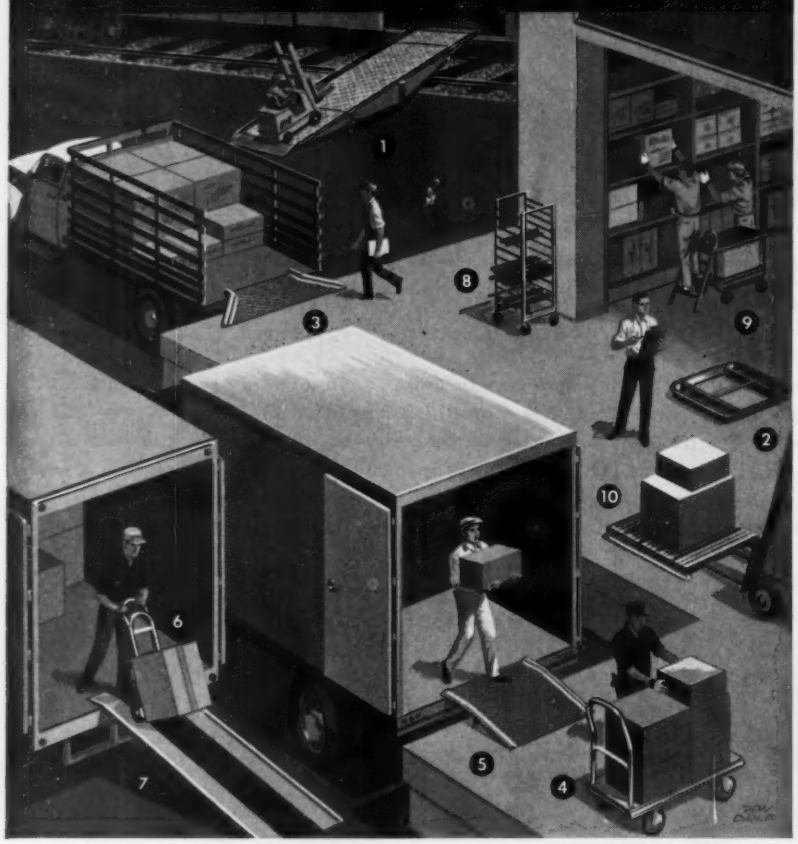
STORAGE RACK DIVISION

5961 Linsdale Ave. amp® Detroit 4, Michigan

Manufactured in Canada by Sunshine-Waterloo Co., Ltd., Waterloo, Ontario

Circle 6 on Reader Service Card

10 REASONS WHY B & P IS GROWING, GROWING, GROWING!



1. **FOLDING YARD RAMP:** Takes half the space—moves easier—stores in less space.
2. **PALLET DOLLY:** For a short haul—a must for production lines or warehousing.
3. **DOCKBOARDS:** Built especially for *your* dock—one piece curb with forged ends.
4. **PLATFORM TRUCK:** Light—eye appealing—rugged.
5. **ECONOBORD:** Carries loads to 4800 lbs.—truckers special.
6. **HAND TRUCKS:** Light—rugged—versatile—forged ribbed nose plate.
7. **PORT-A-RAMP:** No dock needed—deliver anywhere—safety all weather walk.
8. **ECONORAK:** All purpose—assemble yourself—economical.
9. **STOCK PICKING TRUCK:** Reaches high areas easily, safely—ladders available for your present trucks.
10. **PALLET:** Built to *take it*—assemble yourself (if you wish).

Dealers coast to coast to—survey *your* problems—analyze *your* needs—recommend *proper* equipment

Write today for more information on any of the above products.

b+p **BROOKS & PERKINS, INC.**
1938 W. Fort Street • Detroit 16, Michigan
Tel. TA 5-5900
ALUMINUM—MAGNESIUM—STAINLESS STEEL

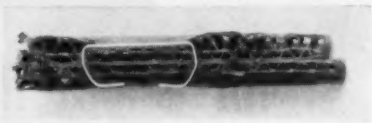
Offices in: Washington—New York—Dayton—Boston—Long Beach, Calif. 61-MH-8

Circle **17** on Reader Service Card

PRODUCT NEWS

Stapler Penetrates Two Double-wall Boards

Company's new ⅞-inch leg wide-crown stapler goes through two thicknesses of double-wall board. Useful also for fastening two layers of tri-wall, where blind clinching into the



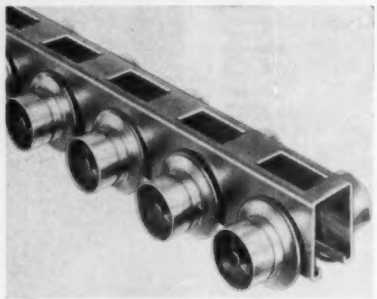
first flute of the second layer of tri-wall is satisfactory. Manufacturer says with this new staple size, even deeper penetration can be obtained in tri-wall when flaps are crushed as on partial overlap containers.

Bostitch, Inc.

Circle **326** on Reader Service Card

Stores Light Boxes

A new conveyor wheel, designed for Flow Rack live storage, provides wider carrying surface. A ⅝-



inch flange acts as a guard, maintains carton alignment in extensive runs of storage rack. The flange turns with the wheel, eliminates carton binding and hangup. The wheel cuts down on indentation into container bottoms. Available in live storage racks and assembled in wheel strip conveyors.

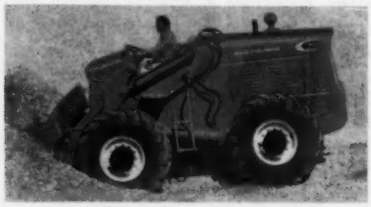
The Rapids-Standard Co. Inc.

Circle **327** on Reader Service Card

Big Tractor Loader

Model TL-30 tractor loader features 10,500-lb. carrying capacity and maximum lifting capacity of 25,000 lb. A four-wheel-drive tractor, it rounds out the Allis-Chalmers line to six models, stands as the largest. Powered by turbocharged diesel engine with rating of 184 h.p. at 2,200 rpm. Single lever provides power shifting on the go at any speed in

forward or reverse. You can get the model with any of six buckets rang-



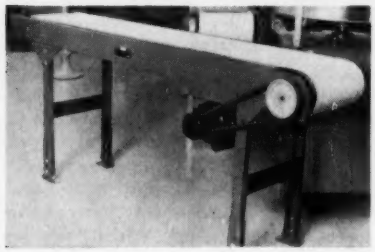
ing from 2½ to 6 cu. yd. Gives breakout force up to 28,000 lb.

Allis-Chalmers

Circle **328** on Reader Service Card

Variable Speed Conveyor

Standard unit comes in fixed speeds of 25, 37½, or 50 feet per minute. Requires no reducer main-



tenance as the reduction gears are mounted inside the drive pulley and sealed for life. Only lubrication points: oil cups for motor bearings and grease fitting for the Hi-Lo pulley.

Island Equipment Corp.

Circle **329** on Reader Service Card

Bales Scrap Metal

Efficient briquetting press speedily handles light gage metal scrap, such as punch skeletons, trimmings, cans, wire, and others. It's a self-contained, compact, hydraulic unit. Get uniform briquettes that eliminate labor-consuming handling of bulky, loose scrap

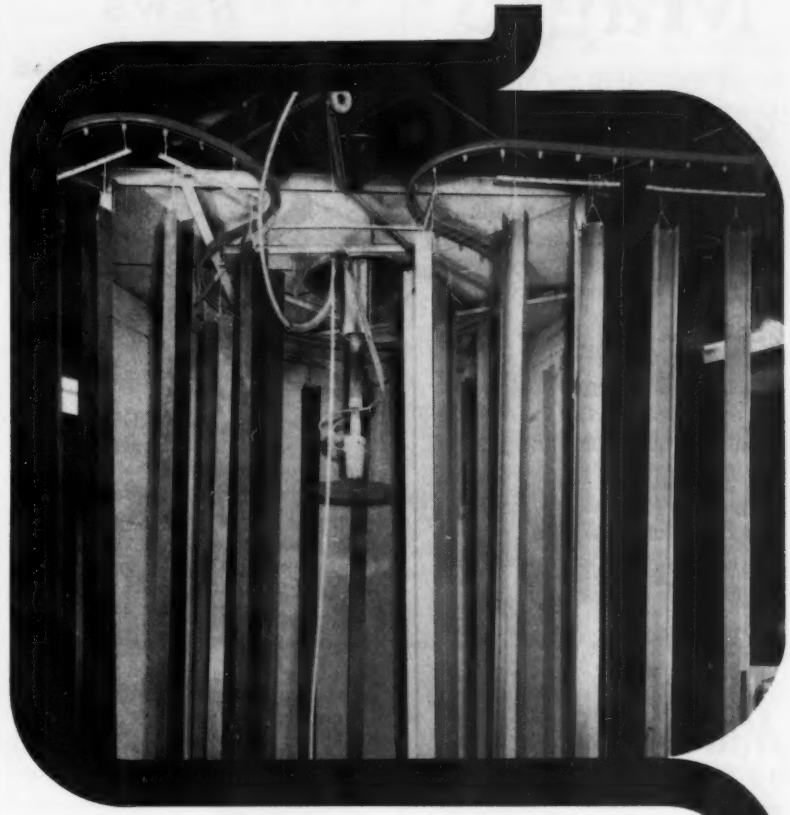
in plants, institutions, hotels, and at scrap dealers' yards. Press comes in three standard models, needs no special foundation. It's portable.

Consolidated Baling Machine Co.

Circle **330** on Reader Service Card

Continued on page 90

CHAINVEYOR CUTS FINISHING COSTS!



This plant installation demonstrates how modern materials handling is effectively applied to new product finishing methods. A Chainveyor overhead system carries lighting fixtures through automatic de-greasing and phosphate coating booths and then in to a booth where paint is applied electrostatically. Continuing along the conveyor line the fixtures are then transported to and through the bake oven completing the entire processing cycle without any manual handling. The result is better quality work — done faster and at lower cost!

For details on low cost Chainveyor systems engineered for all types of industry write:

QUALITY OVERHEAD CONVEYOR SYSTEMS

CHAINVEYOR®

CORPORATION

Engineers & Manufacturers

DISTRIBUTORS IN ALL PRINCIPAL CITIES

MAIN OFFICES:

5618 E. WASHINGTON BLVD., LOS ANGELES 22, CALIFORNIA

Circle **19** on Reader Service Card

Circle 74 on Reader Service Card

Magic

is not involved in the Maitrol® conveyor control system. Maitrol is a straight-forward, uncomplicated system. Magnetically encoded addresses guide your material handling system without interconnecting wires—through any complex of inter-conveyor routing.

- Works with all types of conveyors
- Unlimited encoding combinations
- No rubbing or sliding parts to wear out
- Low cost, high reliability
- Pays for itself fast
- Simple pushbutton or dial control

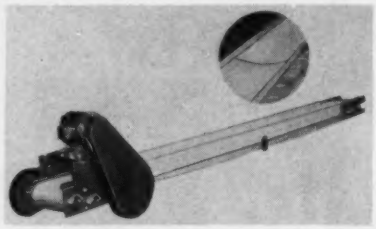
Write today for Maitrol brochure. It gives full details.

Maico electronics inc.
21 N. Third St. • Minneapolis 1, Minn.

PRODUCT NEWS

Conveyor Easily Expanded

Tie-rod, bolted construction permits you to expand conveyors from 6 ft. to 65 ft. in length, from 6 inches



to 24 inches in width. Do it quickly, cheaply. This is a feature of a new, light line of natural-troughing, self-cleaning belt conveyors. Troughs: about 2 inches deep. Special conveyor sides prevent material from lodging under belt. Get steady movement without pileup.

Finco Inc.

Circle 331 on Reader Service Card

Mobile Work Platform

The Adjustable Jr. straddles floor obstacles, makes maintenance and equipment repair safe, quick, and inexpensive. This model is a lightweight, straddler type platform of steel. Available in several models, designed to give access to areas over stationary obstacles up to 44" high and 72" wide. Platform elevates and lowers on a scissoring support frame by a screw type mechanism. Hand or electric power operation available. Mechanical locking device secures the platform.

The Ballymore Co.

Circle 332 on Reader Service Card

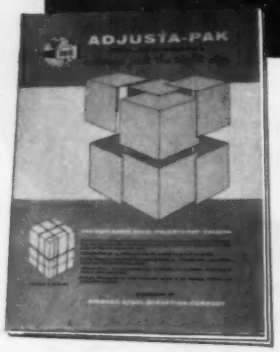
Prints Labels from Roll

Model 126 prints labels on low cost paper or fabric roll stock, die cuts them at 100 a minute. Works with pressure sensitive adhesive stock, and cutter can be set to cut label stock only, leaving backing paper intact, so labels can be rewound, to be peeled from backing when needed. Or they can be cut and stacked. Available variations for 1- or 2-color imprint, sizes to 2¼ in. x 6 in. For part of imprint that changes frequently, such as part name and number, machine uses inexpensive metal address plates which can be changed quickly.

Markem Machine Co.

Circle 333 on Reader Service Card

Signode Adjusta-Pak container telescopes in all 3 dimensions



- Saves time and money
- Eliminates various sizes of master containers
- Speeds packaging of mixed lot shipments
- Improves product protection

New booklet shows how Adjusta-Pak works, shows how Adjusta-Pak is used to package textiles, machinery, sheet steel, paper products, wood doors. Send for your free copy of this way to new packaging savings today.

SIGNODE STEEL STRAPPING CO.
Dept. SP, 2618 N. Western Avenue, Chicago 47, Illinois
Offices Coast to Coast
Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

Circle 108 on Reader Service Card

NEW

POLYETHYLENE TANK WITH SPIGOT . . . STORES AND DISPENSES LIQUIDS AND GRANULAR SOLIDS

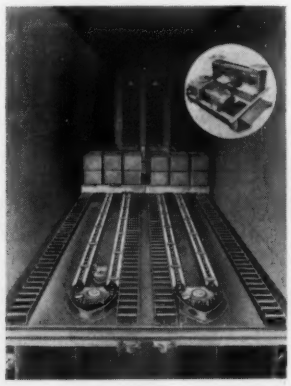
Viscous materials, granular solids and liquids flow freely through the spigot on the new Redmanson polyethylene tank. Corrosive liquids can be stored and dispensed as the spigot is also polyethylene. These tanks cut storage costs because they last longer than steel and cost far less than stainless. They are easy to clean, light in weight and content levels can be checked as the walls are translucent. A breather cover permits venting. Sizes up to 55 gallons with a ¾" or 2" spigot. Write for information and prices.

REDMANSON CORPORATION
630 Loucks Mill Rd. York, Pennsylvania
Distributorships and mfg. rep. territories available

Circle 99 on Reader Service Card

Trucks Unload Mechanically

Company has developed a Power Pusher Conveyor for unloading trail-



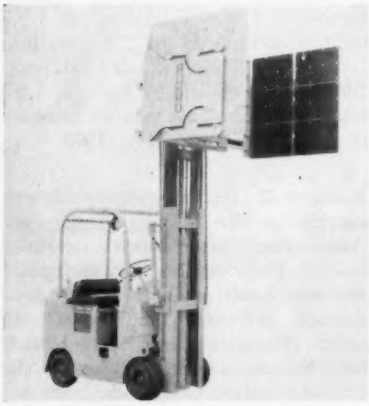
er trucks, says it does an entire unloading sequence in a fraction of the time under former methods. The pusher (actually a bar across the back of the truck and not seen in the photo) activates by motor drive. The entire palletized load pushes onto a dock at a predetermined rate. A conveyor on the dock, the same width and length as the conveyor on the truck floor, completes the unloading process.

The Alvey-Ferguson Co.

Circle **334** on Reader Service Card

Cuts Carton Handling Cost

For handling cartons new Towmotor 501 fork lift truck has special side-shifting carton clamp and triple



lift mast. Clamp handles cartons from 23 to 70 in. wide, weighing up to 4,000 lb. a load. Stacks in tiers 18 ft. high. Has 48-in. telescoping vertical backrest for extra high loads. Side shifter speeds stacking.

Towmotor Corp.

Circle **335** on Reader Service Card

RUGGED REVOLVATOR LIFTS
are adapted to your needs

Since 1904 Revolvator has been building portable elevators and related lifting equipment. Portable elevators are available in any reasonable lift and platform size in capacities from 500 lbs. to 5,000 lbs. Lifting may be by cable or hydraulic, hand operated or electric, according to requirements. Variations of fixed or revolving base, telescopic masts and other accessories are available.

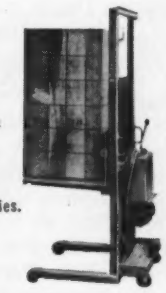
Portable cranes, barrel and carboy handling and dumping lifts and similar types of equipment are based on the same rugged Revolvator components and design as the basic portable elevator.

INDEX No. 11.17

Revolvator portable elevator. Electric powered telescopic mast type shown. Revolving bases and other features available.

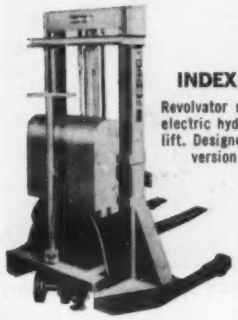
INDEX No. 11.21

Uplifter with two speed hand hoist and dual capacity. Stock unit available in standard sizes.



INDEX No. 11.22

Uplifter with electric hydraulic hoist with two roller chains. Stock models available in two sizes and capacities.



INDEX No. 13.22

Revolvator manually moved, electric hydraulic hoist fork lift. Designed for later conversion to fully powered Go-Getter.

INDEX No. 11.31

Revolvator semi-portable hydraulic lift table. For sheet feeding, etc. Where conditions do not permit submerged pistons as with Index 12.21 models.

INDEX No. 31.10

Revolvator barrel dumper with either hand or electric hoist. Either front or side dumping models discharging at any reasonable level to suit requirements.

REVOLVATOR CO.

ESTABLISHED 1904

Designers and Manufacturers of Portable Elevators, Power and Hand Lift Trucks, Hydraulic and Traction Elevators, Carboy and Barrel Dumpers, Portable Cranes, Positioners, Storage Racks, Turntables and Other Material Handling Equipment.

NORTH BERGEN, NEW JERSEY

8739 Tonnele Avenue

NORTH BERGEN, NEW JERSEY

Sales Representatives in Leading Centers

Circle **101** on Reader Service Card

ASSOCIATIONS

AMHS The society held its 13th Annual Board of Directors meeting on June 24 and 25. National officers for the 1961 - 62 season were announced. Robert Sparrow, former first vice president, moved up to president. Chester E. Anderson, vice president of Region 5, became first vice president. John Klomp was elected second vice president and Paul Allen, secretary. Amos Greer retained his post as treasurer.

PRESIDENT-ELECT Sparrow makes a report.

Niagara Frontier Chapter's 1961-1962 officers and directors are: William H. Snyder, president; Byron McKinley vice president; and Charles J. Mast, Secretary-treasurer. National director is Eric W. Pratt. Directors (1 year term) are: David E. Cardis, Harry J. Riether, Olyn H. Parker and William F. McQuillin. Two year term directors: Wallace Blakelock, Stephen Czerniak, Alan S. Payne, Robert Fitzgerald, Joseph Debo, and Albert H. Gille.

Minnesota Chapter's new officers are; Elmer Hammes, national director; Leslie Edklund, president; John Swanholm, vice president; Bernard Lossing, secretary; and Richard Scanlon, treasurer.

ALTAPEM K. E. Forster, general sales manager, Barrett-Cravens Co., has been elected president of the Association of Lift Truck and Portable Elevator Manufacturers. Stanley R. Bryant, marketing division manager, The Raymond Corp., was named vice president. The trade association management firm of Hanson & Shea, Inc., was elected secretary-treasurer.

SPHE The Eastern Chapter of the Society of Packaging and Handling Engineers will offer a complete basic course in package cushioning this fall. Alfred D. Brown, vice president, Herculite Protective Fabrics, Inc. is coordinator. Lecturers include: Frank Settele, New York Air Procurement District; Martin Fox, Allcraft Container; Robert Jones, NOPCO Chemical Co., Plastics Division; George Roshkind, Container Laboratories, Inc.; and James Hardigg, Hardigg Industries. Lectures will be held in New York City on alternate Thursday evenings from September through November. Further information available from Alfred D. Brown, Herculite Protective Fabrics, Inc., 661 Fourth street, Newark 7, N. J.

NPA Donald F. Morris, president, The Mead Corp., has been elected a director of the National Paperboard Association.

MHI Rubbermaid, Inc., Wooster, Ohio and Admos, Inc., Detroit, are new member-companies of the Material Handling Institute, Inc. B. T. Ramsey, sales manager of the Industrial Products Division represents Rubbermaid, and H. C. Blake, executive vice president, represents Admos in MHI activities. Greenbrier, White Sulphur Springs, W. Va. resort will host the business-social-annual meeting of MHI, October 30-31 and Nov. 1.

NEW MHEDA PRESIDENT Don S. Ferguson (right) of Los Angeles receives congratulations from outgoing president Robert G. Arnold of Salt Lake City. Ferguson was elected at the Material Handling Equipment Distributors Association's National Convention held in Denver June 1-3.

FPBA Shipments of folding cartons have topped year-ago levels. The Folding Paper Box Association of America reports dollar volume of carton shipments in May up 2.1 percent from May, 1960, with tonnage 2.9 percent higher. Industry volume was estimated at $79.7 million, compared to $78.1 million last year. The industry shipped 198,663 tons of folding cartons during the month. This was an increase of 5,563 tons over May, 1960.

William D. Hall, director of research for the Folding Paper Box Association of America, retired July 1. Hall had been in charge of the association's technical and production activities for the last 10 years. Before joining the FPBA, he held executive positions in the printing industry and was director of production-management of the Printing Industry of America. He plans to open an office at 407 Arlington avenue, Elmhurst, Ill. where he will work on cost reduction, methods improvement and related programs in the folding carton, packaging and graphic arts industries.

D. A. Forsberg, president, Forsberg Paper Box Co., has been re-elected president of the Folding Paper Box Association of America. New members of the association's executive committee are: W. W. Fitzhugh, Jr., president, New Haven Board & Carton Co.; and E. B. Wall, vice president, Federal Paper Board Co. Inc. Continuing members are: Herbert C. Bernard, Shuttleworth Carton Co.; Charles Ruble, Sr., Standard Paper Box Co.; Leo H. Schoenhofen, container Corporation of America; and C. B. Stauffacher, Continental Can Co., Inc.

Ten boxmakers have been named directors-at-large of the Folding Paper Box Association of America. They are: Cameron Clark, Jr., Warner Brothers Co.; Dan Int Hout, Jr., Michigan Carton Co.; Robert D. James, Consolidated Paper Co.; Fred W. Kewell, II, Western Paper Box Co.; Byron H. Lengsfield, Jr., Lengsfield Brothers, Inc.; Donald A. Snyder, Marathon Division of American Can Co.; Paul Strange, Jr., John Strange Carton Co.; W. S. Stuhr, United Board & Carton Corp.; and E. B. Wall, Federal Paper Board Co., Inc. and Richard J. Walters, Diamond National Corp. National directors are: W. J. Alford, III, Alford Cartons; E. J. Bonville, Robertson Paper Box Co., Inc.; R. F. Burroughs, Sr., Trenton Folding Box Co.; W. W. Fitzhugh, Jr., New Haven Board & Carton Co.; D. A. Forsberg, Forsberg Paper Box Co.; Arthur L. Harris, Mead Packaging Division of The Mead Corp.; Charles Ruble, Sr., Standard Paper Box Corp.; Leo H. Schoenhofen, Container Corporation of America; and Charles B. Stauffacher, Continental Can Co., Inc.

NIPHLE Latest members of the National Institute of Packaging, Handling, and Logistic Engineers are: James R. Fox, Jr., president, Pac-Tron, Inc.; Wilson F. Francis, program manager, Bureau of Naval Weapons; J. R. Nelson, Seal Bag Co., Inc.; John N. Nickell, Editor, Canadian Packaging; Robert R. White, Newark, Delaware; George E. Murph, Army Chemical Corps; Frank C. Warner, Decatur, Ala.; James V. Richards, Bemis Brothers Bag Co.; H. Rodgley Simpers, Army Chemical Center; and George M. Jewitt, Hedwin Corp.

New Weld-Bilt "RIDER-BOY"

Weld-Bilt PRODUCTS

Self-Propelled
PLATFORM
LIFT TRUCK

LIFTS as it TRAVELS!

Adds New Speed to —

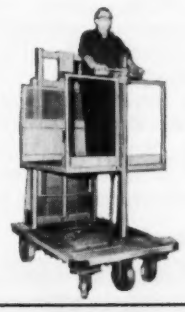
ORDER PICKING
PRODUCT MOVEMENT
OVERHEAD MAINTENANCE

CHECK the unusual advantages of new "Travel-N-Lift" RIDER-BOY against your needs! You, too, will call it today's handiest, most versatile Platform Lift Truck — for factory, warehouse and storage area. It cuts manpower hours . . . Permits *one* operator to do the work of *two* — for time and labor-savings in order picking, product handling, stacking and storage, overhead maintenance, equipment assembly and many other tasks.

Simple to operate, push button controlled from the steering tiller, Self-Propelled RIDER-BOY lifts and lowers man and load as it moves, for time-saving positioning at loading or unloading heights. Lifts to any height up to 14 feet, handles loads up to 1000 lbs.

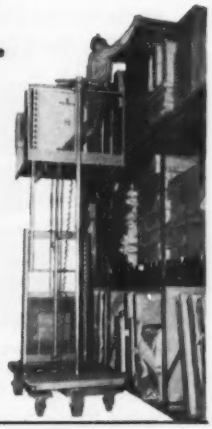
New RIDER-BOY is electro-hydraulically operated, powered by heavy duty industrial batteries, equipped with built-in charger. It more than pays for itself in product handling efficiency, convenience and safety!

Prove this to your profit! Write for bulletin RB660, and the complete story on RIDER-BOY SELF-PROPELLED PLATFORM LIFT TRUCKS.



LIFTS AS IT MOVES

HIGHLY MANEUVERABLE



SPEEDS ORDER PICKING

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS

335 Water Street, West Bend, Wisconsin

Circle 124 on Reader Service Card

Industry's No. 1 Dockboards

SPEED-UP DOCK OPERATIONS

at New

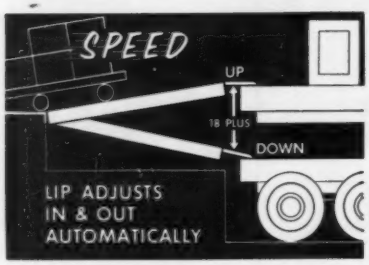
Carling Plant

(Baltimore, Md.)

Kelley ADJUST-A-LIP

Unstable pallet loads of fragile bottled goods move quickly, smoothly, safely from loading dock to truck at Carling's new Baltimore plant. The reason is Kelley Adjust-a-Lip Dockboards that make the carrier floor part of the dock! Long, wide Kelley Dockboards permit loading right up to the side of the carrier for stable — tightly-packed truckloads. If you are planning to build a loading dock, or remodel your present dock, Kelley Dockboards deserve your serious consideration.

Write for the FREE Kelley "Profitable Dock Planning Kit."



FREE DOCK PLANNING KIT MAILED TO YOU ON REQUEST.

Includes dock layout recommendations i.e.: aisle, canopy, driveway requirements, current trailer restrictions, etc. Check your requirement:

☐ REMODELING KIT
☐ NEW CONSTRUCTION KIT

Tear out and attach this coupon to your letterhead. Sign your name and mail to:

HI-LO Adjustable DOCKBOARDS

KELLEY COMPANY, INC.

2139 W. MILL ROAD, MILWAUKEE 9, WISCONSIN

Circle 67 on Reader Service Card

mhe INDUSTRY NEWS

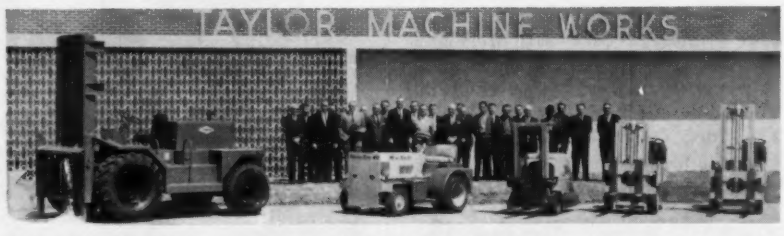
SIX SENIOR SALES REPRESENTATIVES of Lewis-Shepard Products Inc. receive 25 year awards at a Senior Marketing Conference dinner held in their honor. Standing, left to right: E. E. Wallace, E. E. Wallace and Son; R. E. Moore, Material Handling Equipment Co.; W. H. Jaynes, Ward-Jaynes Equipment Co.; and N. W. Erlandson, L-S Distributors, Inc. Sitting, left to right: L. E. Stewart, L. E. Stewart and Son, Inc.; and S. E. Horton, Jr., Industrial Handling Equipment Co. J. Edward Freemann, not pictured, senior sales representative, received a special honor for 40 years' service. He is with the Material Handling Equipment Co., Inc.

Flo-Tronics Buys Waters Corp.; Announces West Coast Expansion

Flo-Tronics, Inc. has announced a merger with Waters Corp., manufacturers of medical electronics equipment. Merger was based on an exchange of stock.

At a recent directors meeting, approval was given for issue of 500,000 debentures to the Florida Capital Corp., for 12 years at 6 percent interest. Proceeds will be used to establish a west coast division for the Waters Corp. They will expand its medical electronic product line, and broaden the scope of the Flo-Tronics Electronics Control Division.

Under the merger agreement, George Waters remains president of the Waters Corp., and becomes a director of Flo-Tronics. Waters Corp. was founded in 1940, has been in the medical electronic equipment field since 1948.



TAYLOR'S new 10,000 pound fork lift truck is displayed with the Mobilift line of lift trucks in front of Taylor Machine Works plant, Louisville, Miss. Pictured are Taylor Machine Works personnel and sales representatives of Motec Industries, Inc., Hopkins, Minn. The group recently participated in a 3-day sales meeting prior to the Southern Pine Machinery Show at New Orleans. Taylor has just become factory franchise distributor for Motec in Alabama, Arkansas, Florida, Louisiana, Mississippi, and western Tennessee.

New Executive VP at Jeffrey Manufacturing

Directors of The Jeffrey Manufacturing Co. have named Frank J. Durzo executive vice president. Durzo joined the company in March of 1947 as industrial engineer supervisor.

Durzo

Durzo replaces C. J. Leifeld who retired May 31 after a career of 45 years with Jeffrey. Since 1958, Durzo was vice president in charge of manufacturing.

GE Appoints Manager of Process Automation Engineering

Randolph L. Houlton has been appointed manager—process automation engineering by the General Electric Industry Control Department, Salem, Va.

Houlton's group will create industrial process automation control systems. Houlton has been with GE since October, 1946.

Newly Named Executives Take Posts at Signode Steel

John M. McGregor has been elected senior vice president by the board of directors of Signode Steel Strapping Co., Chicago.

McGregor

Other elections include: Hobart P. Young, vice president in the Manufacturing Division; Joseph F. Beckman and Milton C. Carlson, vice presidents; and A. N. Perry, assistant vice president in the Sales Division. Hugh Bunten was elected vice president and secretary. The Signode directors reelected all other officers.

Vergobbe Heads Sales at Conveyor Specialty

Richard E. Vergobbe has been elected vice president—sales of Conveyor Specialty Co., Inc., North Quincy, Mass.

Vergobbe

He had been sales manager for four years. Formerly he was chief engineer of an associated organization, Norfolk Iron Co.

Continued on page 96

Just off the plane and HERE COMES YOUR LUGGAGE

Turntables in incoming domestic flight area at Montreal International Air Terminal. The 80-foot perimeter of each slowly rotating luggage dispenser provides adequate space for passengers to identify and claim their luggage.

AN AIR TRAVELER'S DREAM COME TRUE!

You have just stepped off a plane with other jet-age travelers, and already an intricate system of belt conveyers, vertical hoists and turntables has been set in motion. The object—to get your luggage to you as quickly and as smoothly as possible—without confusion or delay. This is a good example of outstanding performance—the extra you get in Mathews Conveyers.

Write today for Bulletins U.A.L. 61—M.I.A. 561.

MATHEWS CONVEYER COMPANY

GENERAL OFFICES . . . . . ELLWOOD CITY, PENNSYLVANIA
PACIFIC COAST DIV. . . . MATHEWS CONVEYER COMPANY WEST COAST, SAN CARLOS, CALIFORNIA
CANADIAN DIVISION . MATHEWS CONVEYER COMPANY, LTD., PORT HOPE, ONTARIO.

MATHEWS

Over Fifty Years of Leadership in Mechanized Handling

Circle 79 on Reader Service Card

Make GOODALL *Your Buy-Word for* BELTING... *Watch Handling Costs Come Down!*

No matter what kind of product your conveying job involves, you'll find a particular brand of Goodall Belting that will reduce over-all handling costs through longer service life with minimum maintenance.

"SUPER TRIPLE-S". Goodall's finest Bulk Conveyor Belting... with a long-established reputation for outstanding quality and reliability. Used for handling crushed stone up to 10", ores, slag and other highly abrasive materials, wet or dry.

"TRIPLE-S" and **"LA CROSSE"** will serve with equal efficiency and economy in less severe services.

"HI-CLIMBER"®. The heavy-duty Incline Conveyor Belting for handling cartons, boxes, baskets, bags, cans, etc., with the consistent reliability that means low conveying costs. Special diamond-impression non-slip surface keeps packages in place on inclines up to 35°. Widths up to 44".

"SKY-KLEET"®. That name identifies specially-designed rubber cleats available on Goodall Conveyor Belting used for handling packages, small parts, stampings, minerals, chemicals, etc., on fixed or portable conveyors. Cleats are integrally molded to the belt, and spaced at any required distance.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch or Write for Catalog

Manufacturers of Mechanical Rubber Products—Since 1870

Standard of Quality HOSE · BELTING · FOOTWEAR CLOTHING · EXPANSION JOINTS · PACKINGS · LINERS, ETC.

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N.J.
Branches and Distributors Throughout the United States and in Canada

Circle 52 on Reader Service Card

INDUSTRY NEWS

Brooks & Perkins Names Marketing Vice President

W. O. Chamberlin, Jr., has been elected vice president—marketing, of Brooks & Perkins Inc., Detroit.

Chamberlin

Chamberlin joined the company in late 1960 as director of marketing. He previously was with several aircraft manufacturing firms, and his most recent position before joining Brooks & Perkins was director of advance planning of Cook Electric Company's Technological Center.

Nutting Promotes Schlatter

Francis J. Schlatter has been appointed sales manager of Nutting Truck and Caster Co. He has been with the company 25 years, has held various positions in purchasing, accounting, and costing. He succeeds Arnold V. Stockey, resigned.

Schlatter's previous positions in sales were central district sales manager, assistant to the sales manager, and assistant sales manager.

FMC Moves MH Base

Cincinnati is the new home of FMC Material Handling Sales and Field Engineering. The move from FMC Corp. headquarteers in Riverside, Calif., was made to serve Eastern users better. Manager in Cincinnati is D. D. Derricott, heading a staff of sales, engineering, and field engineering personnel. An inventory of conveyor parts will be maintained in Cincinnati. FMC handling equipment includes conveyors, pallet loaders and unloaders, stackers, unstackers, and clamp trucks.

FMC used to be Food Machinery and Chemical Corp. Chairman Paul L. Davies said the name change was due to "our dynamic pattern of growth in other directions." The firm also produces agricultural machinery, basic chemcials, and defense material.

Moto-Truc Co. Moves Into New Building

A new building at 12400 Taft Avenue, Cleveland, provides more than 50,000 sq. ft. of manufacturing and office space for the Moto-Truc Co. This more than doubles the space the company had at former quarters at 1953 E. 59th St.

The new plant is specially designed for building the company's line of walkie and small rider industrial trucks.

Three Companies Announce Mutual Support Agreement

An agreement of mutual support in the engineering and marketing of automated control systems and processes is announced by Allis-Chalmers, Consolidated Systems Corp., and International Business Machines Corp.

The three companies will work together when it is in the best interest of the customer to have a coordinated system. A typical integrated system will use AC's basic industrial equipment, Consolidated Systems' special instrumentation, and IBM's data processing equipment.

Bechtel Directs Clark International Operations

J. Frederick Bechtel has been elected executive vice president and general manager of Clark Equipment International, C.A. He will assume duties formerly carried out by Walter E. Schirmer. Schirmer was recently elected executive vice president of the parent company.

Bechtel

Bechtel joined Clark Equipment in 1952 as general counsel. He was appointed assistant secretary and assistant treasurer in 1954 and elected vice president and secretary in 1956. He is a director of Clark Equipment International, C.A., Clark Equipment Credit Corp., and Canadian Clark, Ltd.

Fuller Co. Names Director of Engineering

General Harry A. Markle, Jr. has been appointed director of engineering for the Fuller Co. He will direct all Fuller Co. divisions, subsidiaries, and affiliates.

Miller Appointed VP at Motec Industries

James A. Miller, director of engineering, has been appointed vice president in charge of engineering research and development of Motec Industries, Inc.

Miller began his engineering career in 1942. He joined Motec Industries in 1959. He holds patents in automotive, materials handling, and in farm and construction equipment.

Continued on page 99

Powell FLOW-MATIC system discharges box contents automatically, via gravity feed, at proper work level. Lift truck has easy access to load and unload boxes.

POWELL FLOW-MATIC®

trims handling time 30%, saves 20% in storage space

Federal-Mogul Division improved its bulk handling of small parts with a low-cost Powell FLOW-MATIC materials handling system. Its Cleveland Plant gained more than 20% in limited floor space, saved 30% in handling time . . . while producing 60-80 million bushings, spacer tubes and washers yearly.

Simplify your production, handling and storage with the Powell FLOW-MATIC system. Write for *Bulletin FM* today.

THE POWELL PRESSED STEEL COMPANY

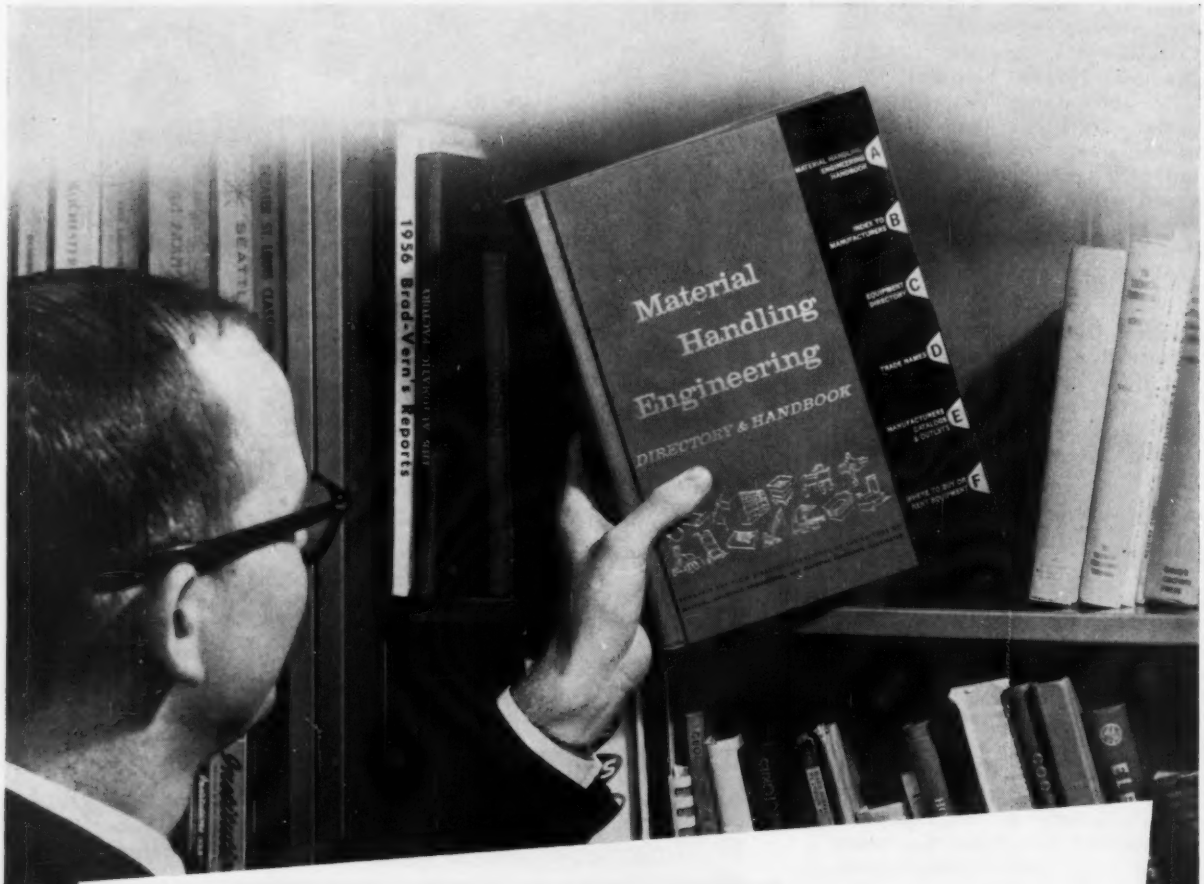
DEPARTMENT 201-8 • HUBBARD, OHIO

Materials handling is our only business

Powell FLOW-MATIC systems reduce handling time as much as 48%.

Circle 97 on Reader Service Card

Here's your standard reference for . . .
products · manufacturers · trade · names
local suppliers · engineering data



You will find more material handling equipment information shoe-horned into the MATERIAL HANDLING ENGINEERING DIRECTORY & HANDBOOK'S 1,004 pages than in any half-dozen other volumes. It will supply you with 1,040 listings of more than 400 kinds of handling, packaging and storage needs, tell you who makes them, their trade names, where you buy them locally, offer you 262 pages of engineering and application data. Keep it handy. And whatever you do, don't let it stray. The current edition is sold out. You can't get another until the 1963/64 edition is published in November 1962.

1960/61 Material Handling Engineering
DIRECTORY & HANDBOOK

BY THE EDITORS OF MATERIAL HANDLING ENGINEERING MAGAZINE

THE INDUSTRIAL PUBLISHING CORPORATION
812 HURON ROAD • CLEVELAND 15, OHIO • SUPERIOR 1-9620
OFFICES: NEW YORK • CHICAGO • LOS ANGELES • LONDON

INDUSTRY NEWS

Distributor News and Company Reps

Wright Hoist Division, American Chain & Cable Co. has appointed **Thomas R. Merritt** as district sales manager of its southern sales district.

Hartman Metal Fabricators has named **R. L. Barker and Associates** as a representative in Metropolitan Chicago.

American Pulley Co. announces the appointment of **P. W. Voss & Associates** as a franchised distributor in the Chicago and northern Indiana area.

Faultless Caster Corp. has promoted **Kenneth A. Jones** to the newly created position of mid-western district sales manager. **Floyd P. Kingston** succeeds Jones as a sales representative in the Chicago territory. **William S. Hutson** is in charge of a new sales office in Minneapolis-St. Paul.

CLASSIFIED ADVERTISING

OVERHEAD CRANES

P&H O.E.T. Crane 150 ton 71′ span with 50 ton auxiliary hoist
Niles O.E.T. Crane 50 ton 71′ span with 10 ton auxiliary hoist
Morgan O.E.T. Crane 20 ton 34′ span with 5 ton auxiliary hoist
Morgan O.E.T. Crane 20 ton 47′ span with 4 ton auxiliary hoist
Shaw O.E.T. Crane 3 ton 41′ span

Any reasonable offer will be considered. For complete details, write R. K. Stevenson, The Beckett Paper Co., 4th & Dayton Streets, Hamilton, Ohio.

Metal Edge Industries has appointed **William E. Welter,** Dallas, Texas, and **L. Fred Phillippi,** Detroit, as district managers of the company's Southwest and Michigan territories, respectively.

Stanley Steel Strapping Division of The Stanley Works has appointed **William M. Walsh, Jr.** a sales representative. He will cover Vermont and Western Massachusetts.

DRIVE-IN DRIVE-THRU Ridg-U-rak PATENTS PENDING **SYSTEMS**

Fill the cube with loaded pallets or skids

"BABY, IT'S COLD IN HERE"

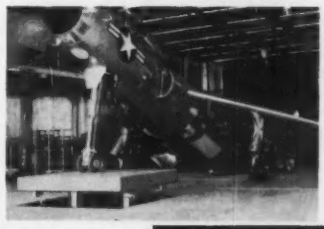
"RIDG-U-RAK" Drive-in System stores frozen food products, fills the cube, floor to 18 foot ceiling. "Ridg-U-raks" replace another make of storage rack that could not take the 25° below freezing temperatures. Husky "Ridg-U-raks" fully standardized, feature exterior column flange, double engaging hooks and slots, plus pinch pin locking to secure every column connection without tools, bolts or nuts. Pallet Rails are secured to Rail Supports with an ingenuous single fastener that prevents movement in any direction.

Look behind a "Ridg-U-rak" Column — see how the full length Column Flange (1) stops side movement and (2) double engaging hooks and slots stop downward movement and (3) Pinch Pin stops all vertical movement. For Conventional "Ridg-U-raks" Catalog 107 , for Drive-in and Drive-thru "Ridg-U-raks" Catalog 111

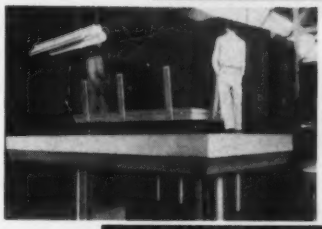
BERNARD GLOEKLER NORTH EAST CO.
NORTH EAST, PA.

Circle 51 on Reader Service Card

Lift anything WITH Rotary LEVELATOR LIFTS



PLANES



PLYWOOD

PAPER

PLANKS

CAPACITIES to 400,000 lbs. Dependable, economical hydraulic power. Standard models and specially engineered lifts for any industrial materials handling requirement. Mail coupon for information.

DOVER Dover Corp., Elevator Division
1059 Kentucky, Memphis 2, Tenn.

Please send information on Rotary Levelator Lifts to:

Name_____

Company_____

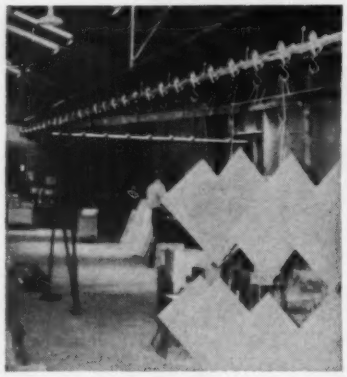
Address_____

Circle 104 on Reader Service Card

Circle 39 on Reader Service Card

ECONO

Overhead Trolley Conveyors



For
Retailers - Wholesalers - Manufacturers

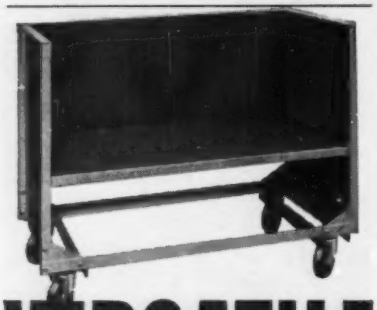
To Aid The Above In

STORAGE - PROCESSING
TRANSPORTATION
ASSEMBLY OPERATIONS

Investigate today this versatile, efficient low cost conveyor.

Write for Literature and Prices

ECONO MFG. CO., Celina, O.



VERSATILE

ALL-PURPOSE TRUCKS

by FIRST WILDER IN QUALITY

27 standard style and 150 standard size platform, shelf, tray, rack, stake, bin, box and table trucks to select from. Special sizes can be furnished.

Write for Complete Information on Wilder's Full Line of Production Handling Equipment

WILDER MFG. CO., INC.
PORT JERVIS, NEW YORK

Circle 129 on Reader Service Card

mhe ADVERTISERS INDEX

Acme Chain Corp. 4
Acme Steel Co. ..... 24 & 25
Albion Industries 36
Allis-Chalmers 26
Alvey Conveyor Mfg. Co. 20
American Manufacturing Co. 84
American Metal Products Co. 87
Automatic Transportation Co. 85

Ballymore Co. 43
Bassick Co. 38
Baughman Mfg. Co. 86
Bendix, Zenith Carburetor Div. 67
Brooks & Perkins, Inc. 88
E. W. Buschman Co. 78
Butler Mfg. Co. 16

Caterpillar Tractor Co. 7
Chainveyor Corp. 89
Chisholm-Moore Hoist Div. Columbus McKinnon Corp. 82
Clark Equipment Co. Industrial Truck Div. ..... 18 & 19
Cleveland Container Co. 32
Columbus McKinnon Chain Corp. Conveyor Div. 39
Convoy, Inc. 76
Corlett-Turner Co. 80

D & M Truck Top Co. 64
Darnell Corp. 41
Dempster Bros. Inc. 22
Drott Mfg. Co. 29
E. I. du Pont de Nemours & Co. Inc. 42

Econo Mfg. Co. 100
Electric Storage Battery Co. Exide Industrial Div. 55
Equipment Mfg. Inc. 31

Faultless Caster Corp.— Inside front cover 35
Federal Fibre Corp. 77

Bernard Gloekler North East Co. 99
Goodall Rubber Co. 96
B. F. Goodrich Co. ..... 12 & 13
Goodyear Tire & Rubber Co. 1

The Heil Co. 79
Hyster Co. 33

Island Equipment Corp. 10

Joyce Cridland Co. 86

Kelley Co. 94

Laher Spring & Electric Car Corp. 23
G. B. Lewis Co. 78
Little Giant Products Inc. 39,41,43
Louden Machinery Co. 27

Magline Inc.—Inside back cover 64
Maico Electronics, Inc. 90
Magnesium Company of America 86
Mathews Conveyer Co. 95
Metzgar Conveyor Co. 14
Monarch Rubber Co. 17
Motec Industries, Inc. 83
Moto-Truc Co. ..... 74 & 75

Nolan Co. 77
Nutting Truck & Caster Co. 28

Samuel Olson Mfg. Co. 80

Powell Pressed Steel Co. 97

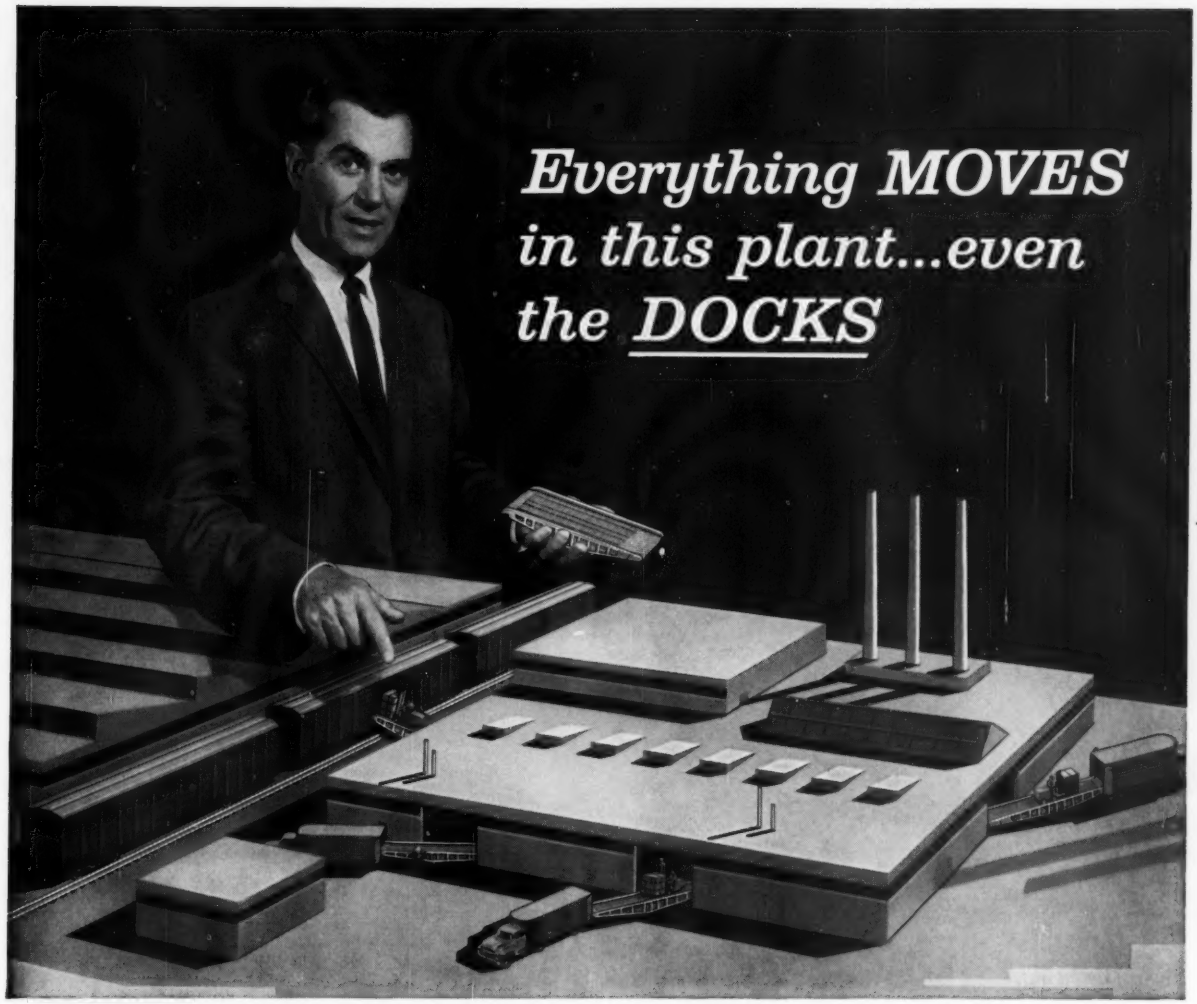
Redmanson Corp. 90
Revolvator Co. 91
Ridg-U-rak Division, Bernard Gloekler North East Co. 99
Robbins & Myers, Inc. 9
John A. Roebling's Sons Div. The Colorado Fuel & Iron Co. 44
Rotary Lift Co. 99
Roura Iron Works 36
Rowe Methods, Inc. 78

Signode Steel Strapping Co. 65, 90
Silent Hoist & Crane Co. 30
Speedrack Inc. 69
Standard Conveyor Co. 76
Stokvis-Multiton Corp. 58
Storack Corp. 40

Towmotor Corp. 11

Uhrden, Inc. 76
Union Steel Products Co. 2
U. S. Rubber Co. 81
U. S. Steel Supply Div. United States Steel 5

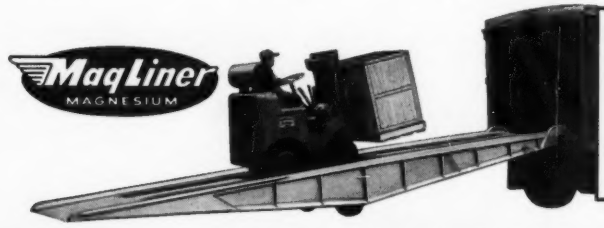
Wayne Mfg. Co. 15
West Bend Equipment Corp. 93
Whiting Corp. 37
Wilder Mfg. Co. 100
Worley Equipment, Inc. 77



...because Magliner Mobil-Docks keep everything moving!

Shipping and receiving in *this* plant are not restricted to one specific location. Incoming shipments are being unloaded at three different points *exactly* where they're needed for production. Finished products move directly from the end of the line into carriers. Loads are handled *once*, at *one* cost. The company can re-layout production areas, departments, or the entire plant at any time because with Magliner Mobil-Docks you *can relocate major load-handling points at any time!* This flexible ground-level loading system fits an infinite variety of plant and warehouse layouts, brings major cost-savings within easy reach of every company . . . large or small.

Read how other companies are using the Mobil-Dock System to lower their cost of doing business. Write for special bulletin MD-212.
Magline Inc., P.O. Box 18, Pinconning, Mich.
Canadian Factory: Magline of Canada Ltd., Renfrew, Ontario



MAGLINER MAGNESIUM MOBILE LOADING RAMP:
Basis of the Mobil-Dock System. A loading dock on wheels . . . ruggedly constructed to handle loads up to 16,000 lbs., more if you need it. Simple hydraulic height adjustment to truck or railcar floor. Non-slip, all-weather grating surface.

MAGLINER MOBIL·DOCK

GROUND-LEVEL LOADING SYSTEM

Circle **75** on Reader Service Card

Every issue of MATERIAL HANDLING ENGINEERING offers a gold mine of material handling, packaging and shipping information. Product facts, catalogs, data books, manuals: the latest facts for your engineering and purchasing files are yours for the asking. The easy way to ask is to use one of the Reader Service Cards bound into this issue.

Franchise Circulation gets magazines to the men who buy

Distilled Writing gets magazines read

Material Handling Engineering

AN INDUSTRIAL PUBLISHING CORPORATION MAGAZINE

812 HURON ROAD • CLEVELAND 15, OHIO • SUPERIOR 1-9620 • OFFICES: NEW YORK • CHICAGO • LOS ANGELES • LONDON